

Introduction

Undoubtedly you'll have seen or read portions of this book elsewhere. By incorporating the writings and comments of other experts, we hope to present a clear, concise explanation of the tattooing process, techniques and terminology.

Some things cannot be improved upon because they're so well done already; this little publication is a case in point, therefore, we offer no apologies for an absence of originality, only the hope that its helpful and informative, as intended.

Tattooing isn't difficult. Just about anyone with good handwriting skills, determination and perseverance can master it. Artistic ability, while an asset, is not essential to becoming a professional tattooist. Tattooing involves a great amount of practising techniques.

Tattooist, their clients and the industry as a whole are a breed apart from anything or anyone else. For many years, tattooing was banned altogether, creating a secret code concerning its activities. The code has long since disappeared but suspicions and reservations about tattoos and the people who have them is still harboured by some. In the past years tattoos have become more acceptable by the general public with rock stars and movie celebrities showing off their art on TV and the big screen.

And while attitudes cannot be legislated concerning tattoos, as members of the industry, we can take into account the image we project to the general public and take responsibility for our own work and shop ethics as well as for the actions of clients in or around our places of business.

TATTOOING HISTORICALLY

The origins of tattooing can be traced back to many different peoples and cultures in all parts of the world. Painting the skin, both temporarily and permanently, has been practised for millennia. Techniques and designs unique to each culture have developed and spread throughout the world.

It was an ancient medical practice to rub soot into wounds. Carbon from the ashes remained in the cuts and made them more visible, a similar tradition was adopted by the primitives to express their grief at the death of a loved one. It was customary to slash one's body and rub ashes into the cuts. When the cuts healed, insoluble carbon particles would remain in the skin permanently. It is quite possible that these practices later developed into planned tattooing of the skin.

A 4000 year old man has been found in Italy near the Austria border. He was tattooed with a small cross behind one knee and above his kidney there are a series of lines about 15 cm long.

An article in the National Geographic Oct / 94 'The Siberian Mummy' by Natalya Polosmak documented the discovery of a 2400 year old tomb of a Pazyryk woman frozen in time. Beneath a tunic soft skin clearly shows two tattoos, one on the shoulder of a mystic creature and the wrist bore flourishes of a deer.

Other direct archaeological records of tattooing were found in Egyptian mummies dating to 2000 BC. Female mummies from the XI Dynasty were found to have rows of dark blue dots on their arms, legs and lower abdomen. These markings may have had some religious significance.

There are many indications that tattooing spread throughout the globe around this time. From Egypt, tattooing spread along the trade routes of the day to the entire Mediterranean area and east to Persia and Arabia. By 2000 BC, the practice of tattooing had reached across Asia to China. The people of southern China developed their own style of tattooing which was passed along to the Burmese to the south who developed even more elaborate design elements. By 1100 BC, tattooing was to be found in Formosa, the Philippines, Borneo and Polynesia. The peoples of Polynesia probably migrated throughout the Pacific, populating such islands as Hawaii, Samoa and New Zealand, taking along with them, techniques and rituals of tattooing.

These migrations began around 450 BC and ended with the settlement of New Zealand around 900 AD.

Tattooing among the Inca Indians of South and Central America dates back to 1100 BC.

To primitive cultures tattooing was universal. Arabian tribes marked the foreheads or cheeks of young girls which were removed with quicklime and soap when she married. In the Nagas area of eastern India and northern Burma, husband and wife carried identifying marks. The Thompson Indians of British Columbia tested courage by applying a painful type of tattoo. In Paraguay the tattoo was a symbol of puberty. Skin embroidery, tattooing with needle and thread was used to enhance the beauty of Eskimo girls. And at one time, Turkish women decorated their chins with tattooed dots.

Some of the earliest written mentions of tattooing are to be found in the Bible. Tattooing must have been common among the Jews because it was expressly banned by Moses. In Leviticus 19-28 he says, 'you shall not gash yourselves in mourning for the dead; you shall not tattoo yourselves.' Again in Leviticus 21-5 he commands, 'priests shall not make bald patches on their heads as a sign of mourning nor cut the edges of their beards or gash their bodies.' Deuteronomy 14-1 repeats this command saying, 'you shall not gash yourselves nor shave your forelocks in mourning for the dead.'

Religious tattooing among the Christians was prevalent and is described in the New Testament. To mark the followers of Jesus, Galatians 6-17 states, 'in future let no one make trouble for me, for I bear the marks of Jesus branded on my body.' The angels of God call out in revelation 7-3, "do no damage to sea or land or trees until we have set the seal of our God upon the foreheads of his servants." And again, the servants of God shall 'bear his name on their foreheads,' Revelation 22-4.

Cicero, the Roman historian described the bodyguard of Alexander of Pharae as *compunctum nois Thraecis*, 'pricked with marks of Thrace.' Tertulian, a second century ad Roman, noted the custom of tattooing females among the Tritons, Picts and Scots. Virgin, Seneca and Galen described the tattooing of citizens at this whim.

Moses was the first to forbid tattooing. Constantine later banned tattooing on the face. The Northumberland Synod of 787 ad banned all tattooing of Christians. Yet tattooing practices were carried on by the monks and Medieval craftsmen of Europe. Many of the Pilgrims during the early Crusades acquired Coptic tattoos on arms and legs, especially designs of crosses and saints to commemorate their crusade. Thevenot, a French pilgrim to Jerusalem in 1685 described the custom; 'We spent all Tuesday, April 29, having our arms marked as ordinarily all the Pilgrims do; it is the Bethlehem Christians following the Latin rite who do that.'

This Christian tradition continued through the centuries and in 1862 the Prince of Wales acquired a cross of Jerusalem on his forearm. A T Sinclair wrote in 1908 that naval officers of the day who visited Jerusalem rarely failed to get a religious tattoo.

Nestorian monks brought tattooing with them from Europe as they moved eastward. The Turks learned their techniques of tattooing from the monks and used them to mark their Christian slaves. Pilgrims to the Shrine of Loretta in Italy between the 13th. and 19th. centuries commonly followed the custom of having their wrists tattooed. In Bosnia, Catholic women acquired forearm designs as a mark of their piety. In Europe witches sometimes symbolized their connection with magical spirits of another sort by placing blue or red puncture marks on their bodies.

Marco Polo in his 13th. century travels to China noted that the Yemen men of China are 'wont to gird their arms and legs with bands or fillets pricked (tattoos) in black that is perfectly indelible.' In Caugigu (Laos) he found the 'the whole of the people, or nearly so, have the skin marked with the needle in patterns representing lions, dragons, birds and what not, done in such a way as to never be obliterated.'

Two centuries later in 1535, the Spanish explorer Oviedo described the tattoos of the Indians of Haiti and Central America. 'In the painting which they place on their bodies, stained and permanent black in colour for as long as they live, breaking their flesh and skin, uniting with themselves this cursed effigy. Thus like a seal imprinted on them and on their hearts a few years later, in 1565, Hawkins described tattooing in the Florida Indians of North America; 'they do not omit to paint their bodies also with curious knots or ant-like work, as every man in his own fancy divideth, which painting to continue the better they use with a thorn to prick their flesh and dent in the same whereby the painting may take better hold. The war paint could be washed off.'

In 1595 the Spanish discovered the Marquesa Islands of POLYNESIA The Marquesans were the most artfully tattooed of the South Seas peoples: 'the bodies and faces are all very worked with a blue colour and some fish and other embroideries are worked out.'

And in 1632 the French explorer Sagard said of the Huron Indians of Canada: 'these tattoos are pricked into the surface of the flesh in the same manner as the crosses which those have on the arms who returned from Jerusalem, and it is forever.'

The Dutch explorer Bosman described in 1700 an encounter with tattooing in West Africa: 'they make small incisions all over the bodies of infants in a sort of regular manner, expressing some figure thereby; but the females are more adorned with these ornaments than males and each at the pleasure of their parents. You may easily guess that this mangling of the bodies of those tender creatures must be very painful, but as it is the fashion here and it is thought very ornamental, it is practised by everyone.'

It is perhaps Capt. Cook who did the most to familiarize Europeans with tattooing. On his 18th. century exploration of the south Pacific he found in Polynesia that; both sexes paint their bodies, TATTOW, as it is called in their language. This is done by inlaying the colour of black under their skin in such a manner as to be indelible. Finally, the Europeans who had been pricking and gouging their skins for centuries, had a name for the process, TATTOW. The word is derived from Polynesian word TA which is their word for knocking or striking, the action they use in applying tattoos.

In Japan, tattooing developed into a fine art. It was prominent there as early as the 3rd. century ad. A Han Wei writing of this time records that the 'men all tattoo their faces and adorn their bodies with designs.' Initially, the position and size of the pattern indicated a man's rank but later the upper classes spumed the practise of tattooing their bodies and tattooed crosses became the mark of criminals.

In the Genroku period (1688-1704) the lower classes revived the practise of tattooing as a substitute for clothing. It was just after this period that many of the outstanding artists of the day including the woodblock artists, Hiroshique, Hokusai and Kuniyoshi, developed tattoo patterns which were used to perfect the hand techniques of tattooing and subtlety of form and design which were unsurpassed.

European royalty became engrossed by the Japanese art. In 1881 the two sons of the Prince of Wales, the Duke of Clarence and Prince George, sought a tattooing and had dragons inscribed into their arms. In 1891 the foremost tattooist of Japan, Hoi (master) Chiyo of Yokihama tattooed Tsar Nicolas of Russia.

Sailors frequented oriental seaports and brought home exotic evidence of their travels. Wild beasts and dragons decorated their bodies and these designs were envied and copied by those at home. Tattooing became a maritime diversion among sailors on long voyages. A full-rigged ship on the chest is said to represent a sail around Cape Horn or to mark the bravery of the topman, the man who climbed the ships rigging. An anchor signified a cruise on the Atlantic Ocean. Sailors in the windjammer days had "hold fast" tattooed on their knuckles as a safety reminder when aloft. In the British Navy, a crucifix on the back of a sailor spared the victim from a flogging should he have been so sentenced. And in 1720 the British Army initiated the practise of imprinting a D for deserter and BC for bad character in half inch high letters onto the side of the chest with a block of needles. These were then rubbed with gunpowder or India ink. The practise was abolished in 1869.

Across the Atlantic in the United States, tattooing began appearing in the early 19th. century. In the 1830s it was popular for ladys to tattoo a permanent blush, everlasting eyebrows and indelible lipstick onto their faces. Martin Hildebrante, one of the earliest American tattooists, placed patriotic emblems on soldiers who fought in the American Civil War.

In 1875 F O'Reilly radically changed the tattooing world with an invention of an electrically operated tattoo machine which was patented in 1891. An early version worked on a rotary principle but this was replaced by the electromagnetic reciprocating machine which has lasted to this day, essentially unchanged. Designs previously requiring hours and days of exacting hand work now took only minutes to execute. It became possible to produce great numbers of tattoos in a very short period of time. This electric technique was further enhanced by the invention of the shadier tattoo machine by Charlie Wagner, patented in 1904.

A tattooed person was always a great attraction at the circus. The history of tattooed exhibits begins in 1691 when the pirate and explorer, William Dampier, brought back to London, the 'Painted Prince Jeoly' for display. It was P T Barnum, displaying Georg Constantine, whose entire body was covered with Burmese tattoos; except for the soles of his feet, Georg's body down to his eyelids, nostrils, face and fingers was tattooed in a shocking menagerie of exquisitely detailed animal forms interspaced with letters of the Burmese alphabet not one pins head of skin was left undone.

From 1900 onward, however, the value of a tattooed exhibit at the circus declined because the phenomenon was no longer as exotic and rare as it had once been. It was 1932 that one of the last circus sideshow stars, the tattooed fat lady, Ms Stevens, enjoyed fame.

Tattooing reached a 'golden age' in Europe at the end of the 19th. and beginning of the 20th. centuries. The royalty of Britain, Russia, Germany and Scandinavia started a rush in the 1890s to get tattooed. In 1893 the visiting Earl of Craven almost drowned his amazed fellow bathers in the pool of the New York Racquet Club when he appeared flaunting his uncovered tattoos. It was popular at this time for young ladies to tattoo the initials of their fiancées on their insteps. A London reader of Pall Mall Gazette suggested marriage, with various combinations of rings used to indicate divorces and remarriages. In the American upper class the fad was for women to tattoo a butterfly on their shoulders. Even Lady Randolph Churchill (Jenny Jerome, Winston Churchill's mother) was tattooed with a snake encircling her wrist.

To accommodate the demand in Europe and the United States in the late 1890's, the master Japanese tattooist, Hor Chiyho opened a shop in London. Another was planned for the United States but never opened.

In 1900, 'Lew the Jew' quit his job as a wallpaper hanger and this decision was to have a major influence on the content of tattoo designs from that time on. He worked as a tattooist in the Philippines during the Spanish-American War and incorporated many of the wallpaper patterns into his tattoo designs. As late as 1933, as many as half of the tattoo designs used in professional shops in America were from Lew the Jew's classic drawings. It is no coincidence then, that tattoo designs look like the walls of grandmother's livingroom.

JAPANESE TATTOOING

Tattooing in Japan was considered to be an art form and human skin regarded as a canvas for artistic expression. In contrast to the Western tradition of applying small, random designs, Japanese tattoos were integrated and well planned designs which began on the back and continued on the chest, arms and legs. Tattooing on the arms usually ended at the elbows so that design could be completely covered by normal clothing. Occasionally tattoos extended to the wrist. These were called the derogatory term, 'sushi ya-boria' which was a low ranking occupation.

Japanese skin is darker than that of Westerners, providing a dark background on which to place tattoos. In this way, colours appear more vibrant than on lighter skin.

Until the 20th. century, the primary colours available to the Japanese tattooist were brown, vermilion, sumi(black) and white. The red pigment was made from mercuric sulphide and mercury poisoning often resulted from the tattoo process. The high fever cause by this poisoning was traditionally used in Japan for treatment of syphilis.

The white pigment available to the early Japanese tattooists was made from lead oxide and caused lead poisoning. It was later replaced by the non-toxic titanium dioxide. With white pigment the Japanese created oshirobori, white tattoos which were invisible under normal conditions But could be seen

when the skin was slightly flushed pink. The white tattoo then contrasts delicately with the pink colour of the skin.

Japanese tattoos were traditionally done in black and white only, employing the traditional sumie or charcoal painting techniques. The sumi or black ink, was applied to the skin in two different ways; *beta* or thickly painted, and *bokashi* or delicately applied for shading purposes. All shading sumi-e tattoos was done in graduations of black, creating a chiaroscuro effect. Once absorbed into the skin the black ink appeared indigo or deep blue in colour.

To apply tattoos the Japanese used a group of at least two needles. The capillary action established by having a least two needles facilitated the absorption of the pigment into the skin. The Japanese were concerned with large designs and used clusters or groupings of many needles to apply these designs. Japanese tattoo needles, which may originally have been bamboo slivers, were placed in rows of five up to 40 needles were bundled together in a circular bunch.

There were two types of needle techniques; *hane-bari* used for producing black areas and *imo tsuki*, used for cutting delicate designs. Because the pigments were applied by hand, a fine and rhythmic wrist action was required. Modern Japanese tattooists have switched to using electric tattoo machines.

Anthropological research indicates that Japanese tattooing did not descend from the tattooing traditions of the South Seas Islands even though they have some similar features. The earliest record of tattooing in Japan is the *Haniwa* or clay figurines which have been found in ancient Japanese tombs. These show distinct facial tattoos which were probably of religious or other ritual significance. In the *Kojiki*, one of the earliest written chronicles of China, it is recorded that tattooing was practised by the people of Japan. Seventeenth century scrolls picture women with extensive body tattooing.

During the feudal period of Japan, tattoos were used as a mark of punishment for criminals. This was called *irezumi*. Usually a criminal was marked around the arm with one black ring for each offence. In rare cases a criminal was tattooed on the face. A special technique existed to remove these rings if the need arose.

Tattooing was later adopted by soldiers as a means of identification in case the soldier's armour and clothing were stripped from his body on the battlefield. The Samurai warriors, however, refused to tattoo their bodies because they considered it below their ranks and because their beliefs snubbed thoughts of death.

At the end of the 17th. century, tattooing began to lose its criminal associations and became widespread. In Edo, the old name for Tokyo, tattooing for ornamentation (*horimono*) developed. Around *Kyoito* and *Osaka* *gaman*, or tattooing for patience was popular. It required patience to endure the pain of tattooing. Because of the pain associated with it, tattooing was a popular way of expressing sincerity. Its permanence was a token of pledge between lovers. Some pious people were tattooed with an image of the Buddha.

At this time the Chinese novel, *Suidkoden*, appeared in Japan. The one hundred heroes of this book were

all illustrated and they were all covered with European style tattoos. These illustrations captured the imagination of Katsushika Hokusai (1760-1849) one of Japan's greatest woodblock artists, who Japanized the characters' tattoos. Hokusai, Utagawa Kuniyoshi and other woodblock artists of the period produced albums which vividly illustrated tattoo designs. These designs were copied and popularized throughout Japan. Japanese tattoo artists incorporated their own traditions of charcoal painting and ukiyo-e woodblock printing into tattooing. Tattoo designs were inspired by the patterns in Japanese kimonos and by the dragons and other heroic patterns found on the clothing of the Samurai. The family crests and protective family gods used as designs on clothing were thought to be too general to be used in tattooing.

In the Edo period (early to mid 19th. century) the society was highly stratified and all activities were strictly controlled by the military. One of the occupations open to commoners was firefighter, a service vital to a city which was frequently by fires. It became a custom for firefighters to get tattooed on their backs and later on their arms and legs. The competition to get tattooed became so fierce than on occasion, even the inside of the foreskin was tattooed.

Tattoos had evolved from symbol of the criminal class into a symbol of manliness, health and vitality. The ruling class who refused to be tattooed tried in vain to ban tattooing because they thought it painful and unpleasant. For the firefighters and other commoners, however, tattoos became a symbol of resistance against the ruling class and were prominently displayed in public baths and at festivals. And for the tradesmen such as palanquin bearers and boatmen, tattoos were eye-catching and good for business

During the Meiji Period (end of 19th. century) Japan opened its tightly closed society to the West. The government banned tattooing fearing Westerners might think the Japanese barbarous. Tattooing on non-Japanese was still permitted and it was the patronage of Westerners, especially sailors at the port city of Nagasaki that kept the traditions of Japanese tattooing alive and spread its fame round the world. It wasn't until after WW II that tattooing was once again permitted in Japan. With the introduction of new pigments, there has been a decline in the traditional black

Tattooing today has become a main stream industry the equipment use is as varied as the designs. Advances in the manufacturing of tattoo equipment the style of needle points as well gauge and quality has improve greatly over the last few years. the designs have gone from cartoonish to artist portrates where the limit is only your imagination.

MORE ON TATTOOING

There are many different criteria by which tattooing can be judged and compared. Some of these will be considered in the following text.

The quality of the line-work can be judged by its evenness, width and variability. A fuzzy, crudely executed line stands poorly next to a fine, exact and precisely defined line. Moar Moko, or deep line tattooing was superbly defined, whereas the line-work of other primitives was broader because of the crudeness of the tattooing instrument. Japanese manual tattooing which used as few as one or two sharp needles, produced really fine lines. Using a three, four or five needle cluster in a modern electric tattooing machine can produce an even line which will come out thick in the hands of anyone not expert. The so called 'one needle' technique can be used to draw the finest line.

CHORIOMA is a measure of the brightness or intensity of the colour and how it is diluted with darker pigment. This reached its acme early in 20th. century Japanese tattooing where many shades of the same colour were effectively used. Few modern tattooists could duplicate the delicate colours of the Japanese until new pigments developed in recent years. If too much colour is injected into an area of a tattoo, pigment overload can occur and the area will appear lumpy.

VALUE is the intensity of light and shading in the tattoo. The subtle value changes in Japanese tattooing are a prime example of this quality. Chiaroscuro is a technique in which figures emerge from a dark background.

HUE is the actual range of distinct colours and how they appear under different types of light. Traditional Japanese technique use primarily black, which appeared blue on the skin and vermilion in early tattoos. later, as many as 17 colours were used. Hor Chyuo. master tattooists of the late 1800's added brown. Early American tattooists limited their colours to blue for outlining and red and green for fill. Brown and yellow were used occasionally. All shades of colour are presently available, including many skin tones and browns.

SHADING graduation is the gradients of chorioma, hue and value perfected by Japanese masters. The electric shading machine doesn't seem to have the subtlety of the Japanese block of graded needles, however, artistic technique and skill can make up for mechanical deficiency.

Tattoos come monochromatic or polychromatic, resulting in different effects. As in any artistic endeavour, the use of one or more colours depends on the effects one wished to achieve against the textured, fleshtone canvas of skin. Often the Japanese used only monochromatic outlining; an alternative to applying colours to a skin coloured canvas is to 'wash' the background with one hue before applying the design.

Changes in the level of the skin were not apparent in the Japanese hand method or in electric tattooing except for the accentuation of parts of the design which are rubbed or placed under hot running water. Keloids, (raised scar tissue) sometimes appear on Negro skin after it has been

tattooed. In the moko technique of the Maoris, keloid did not form after designs were placed on the face. Maoris actually 'dug' grooves in the face, placing pigment in the bottom of the grooves.

The tattoo design may move or change when muscle or joint underneath it is flexed or moved. American tattooists have applied eagles whose wings flap on the chest as the arms are raised. Hula girls properly placed on the biceps of the arm will gyrate when the biceps are bulged. Nude figures can be made to enter into coitus ... letters tattooed on the fingers of both hands form words when fingers are intertwined.

Harmony of design placement or arrangement is an important factor in judging a tattoo. Some follow a carefully balanced plan but others are placed in a helter-skelter fashion. Some extensively tattooed persons acquired their designs with a plan or final goal in mind while others compulsively pile up design after design without regard for the final result. The Japanese are noted for large, panoramic designs which sometimes covers the chest, back, arms and legs as one planned creation. The majority of tattoos applied in America tend to be smaller, non-integrated and non-related without balance in the classical sense. These scrambled designs can be attractive in their own way, however.

The use of realism in a tattooed picture demands skill in drawing and knowledge of light, form, colour and perspective on the part of the artist. Use of abstractionism, surrealism, impressionism or any other art form has been very limited with the exception of primitive cultures where stylism has long been an important element in their tattoos. Choice of subject is a measure of the originality of the tattoo and changes with prevailing fashions and even more with various cultures and should be taken into account when judging tattoos. The ratio of the area of tattooed to untattooed skin is important unless the tattoo has been designed to cover every square inch of available skin. The humanizing effect of the untattooed areas can be effective in contrasting with heavily tattooed skin. This negative space has been overlooked by as many as 50% of tattoo artists. Facial tattoos are generally considered tabu in our present culture, however, contemporary moko facial designs are considered works of art.

Tattoo Styles are not all the same; in fact one can say that each tattoo is a one of a kind.

Whether a tattoo is chosen from flash or custom drawn a tattoo is very personal, but most tattoos can fit into certain genres. Over time tattoos have evolved into many styles, some primitive some modern, but all an artistic interpretation of an idea.

Here is an overview of some of the more popular styles of tattoos and tattooing

1. Abstract Art-Freeform is a modern style involving no outlines and a Picasso like appearance.
2. Black and Gray work is thought to be the true test of a tattoo artist. Shading is heavy and the illusion of a 3D form is achieved without the use of color. This style is derived from prison tattoo, but mechanically far exceeds the expectations of a crude jailhouse.
3. Grey wash is a method of diluting black ink with water to achieve the greys from light to black.
4. Biomechanical is a form of work showing humans meshed with machines. A common theme

is the flesh being ripped away exposing the mechanical inner workings of an arm, for example. Artists such as H.R. Giger and Clive Barker inspire these works.

5. Celtic designs are intricate knots, which represent people and animals from, Welsh, Breton, Gaelic, and Cornish folklore. They are intricate weavings of a singleline. knotwork.

6. Color is a general term covering any style of tattooing involving color. Color can be subtle or vivid depending on the client and the piece.

7. Evil has been a very popular tattoo theme for a long time. Images of spiders, skulls, devils,, demons, and death play with are fascination of mortality, death, isolation, and fear. Shading is heavy in this type of work as well as fine detail.

8. Fantasy Art This generally covers fairies, dragons, angels, women, armored knights, uni corns, and wizards to name a few. These are generally done in splendid colors to convey.

9. Fineline is a modern tattoo style, as tattoo machines have gotten better, and inks and technique have improved, more detail is being added to pieces. Common themes are portraits, animals, biomechanical, and any fine picture, even UPC code bars.

10. Gangster/Biker tattoos are symbols or permanent patches signifying allegiance to a club or gang. Commonly these are Old English script on the stomach, back, neck, or chest, the name of the gang or gang remembers gang name. Teardrops under the eye symbolize people killed, as well as spider webs on the elbows.

11. Haida is the design of the American Indian and Eskimo. Generally tribal flat pieces of animals, totems, birds, and use a few major color.

12. Memorial are ways to immortalize a love one that has passed, or a child's name. These are typically crosses, flowers, scrolls.. Etc.

13. New School is generally regarded as starting in the 1980s; it's a culmination of every tattoo style into one piece. Generally different subject matters are mixed. such has an alien and a car.

14. Oriental. Yakuza is a Japanese style. It is usually colorful and detailed, and contrary to European and American tattooing styles, this style uses the whole body as a motif. No sticker tattoos here, the work is planned out to cover the whole body before the work begins. Tattooing in Japan was outlawed for the working class and the Yakuza (Japanese gangsters) took tattooing in as a secret symbol.

15. Portraits are some of the finest forms of modern fineline tattooing. The artist is extremely skilled in interpreting a photo to skin art. Some results are breathtaking and found in many tattoo magazines. The key to successfully inking portraits is knowing exactly how much detail is too much. Too much detail can lead to fuzziness or much after a few years.

16. Prison tattoos served as a badge or a warning, it showed fearlessness, much like the warriors tattoos in early times. These tattoos are generally threatening featuring skulls, knife, women, or symbols representing crimes and death. Today's black and gray tattooing style stems from jailhouse tattooing. Generally these tattoos were black because black was the only ready color available. The black could be from pen ink, the carbon collected from a burning toothbrush, or metal debris. Most are crudely applied and spawned a tattoo machine made of cassette player motors and such.

17. Religious/Spiritual tattooing has been the basis of almost all tattooing from the beginning of tattooing itself. The oldest man discovered. A.k.a. the iceman, who was frozen where he lay, had tattoos on the back of his knees; believe to be talismanment or spiritual. The Egyptians gave tattooing very religious meanings, the dead were often tattooed so they would have information in the afterlife, priests were often buried with tattooed women who would serve as the canvas of the

Information he would need in the afterlife. Women were often tattooed to aid in fertility. Christians during the time of Christ and shortly after would tattoo a cross under their hand on the wrist; this was a badge and a way to determine who were true believers and who were roman spies.

18. Most of these types of tattoos were very primitive, but lead to some the earliest forms of FLASH, religious tattoos were carved and formed from clay and the image would be stamped onto the subject to serve as the stencil for tattooing.

19. Sailor/Traditional is usually a very basic design, popular in the 1800s to present day. Typical works would be mermaids, daggers, flowers, ships, anchors, snakes, birds, and panthers... but with this style the absolute minimum is put into the tattoo, just enough to convey what it is and the meaning. Later these designs, which line the walls as flash in most tattoo studios, have been reinvented with more detail and artistic flair.

20. Tribal tattoos cover a huge spectrum of different cultures, from Polynesian, Micronesia, or Indian. They are generally black in colour, sold bold geometric designs that complement the shape of the body they are placed on. Common themes are triangles, and curving lines. Modern interpretations have lead to geometric animals, fish, or even skulls. This is also referred to as Flat Tattooing.

21. Wild Style can be recognized from its similarity to graffiti on the buildings of most major cities. It can be a tag on human skin. Very similar to that of the skateboard culture artwork.

THE TATTOO MACHINE

Get to know your equipment, learn the different parts of the tattoo machine and terminology associated with tattooing. It is important that you know and understand the equipment you work with...the how to's and why not's of the profession.

The following is a parts list of a typical two coil tattoo machine:

1) Machine Frame

2) Coils

3) Front Spring

4) Contact Point

5) Back Spring

6) Armature Bar

7) Back Contact Post

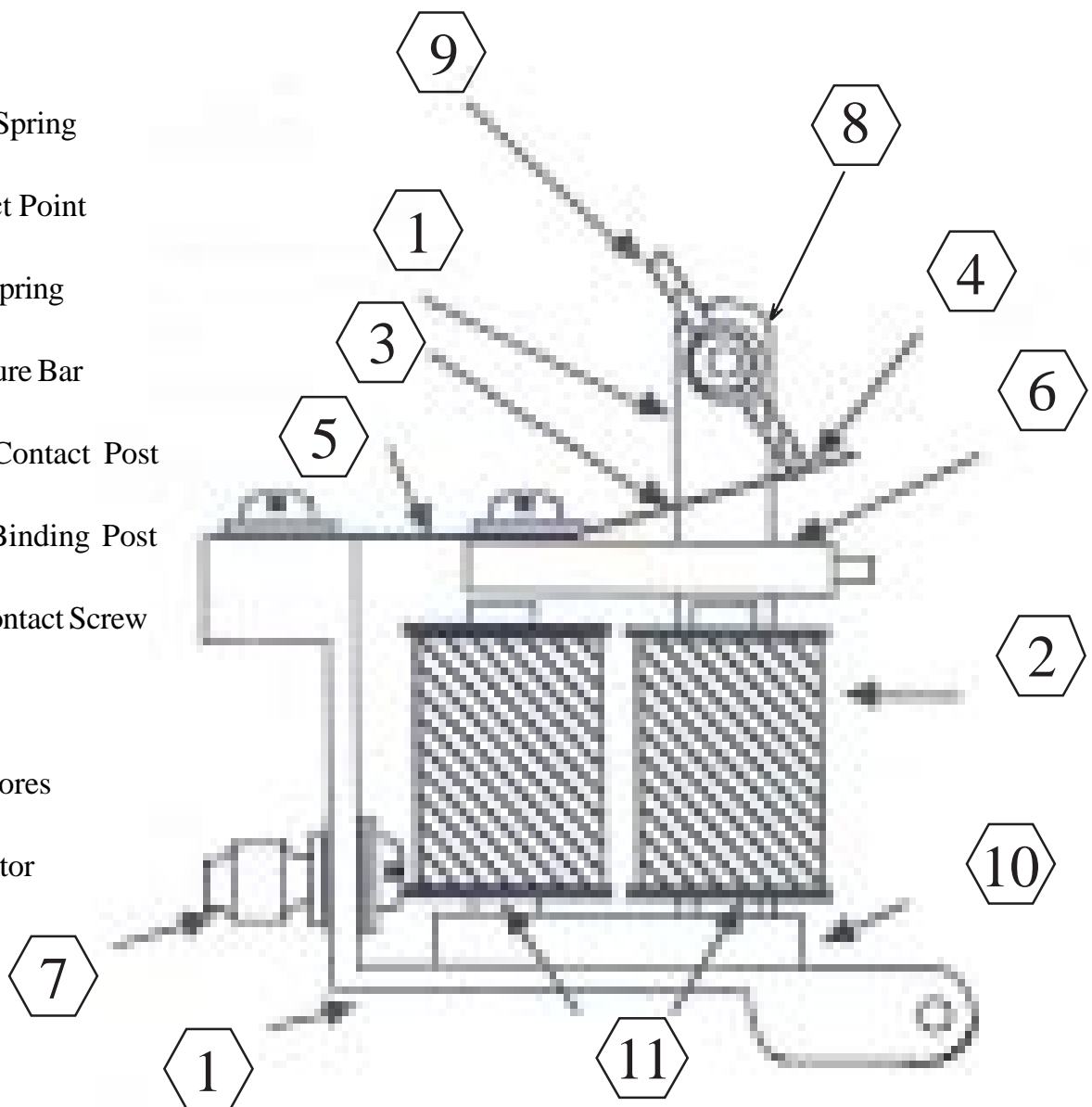
8) Front Binding Post

9) Top Contact Screw

10) Yoke

11) Coil Cores

12) Capacitor



Tattoo machine parts

(1) Machine frame

The machine frame is the part that holds all the pieces together. The frame comes in many different styles, shapes, and materials. It can be made of steel, stainless steel, aluminum or plastic. and it can be machined, stamped or cast. The shape and weight of the frame greatly affects the vibration of the working machine. The heavier machine will absorb more energy from the coils, thus reducing the vibration felt by the person holding it. Some artists choose their machines based upon weight, lighter gives you less fatigue but heavier makes for better shading. Some machines require a yoke to operate properly. The frame incorporates the tube holding chuck. This chuck is where the top of the tube is inserted and holds the tube in place after the needle depth has been determined.

(2) Coils

Most conventional tattoo machines are equipped with two matching coils. The coils vary in size and number of wraps but in most cases are between 8 and 12 wraps. Wraps being the number of layers of magnetic wire wound around the centre. The magnetic wire can be wrapped around a plastic bobbin or around the core. The coil cores must be made from a very good quality magnetic material. The coils are attached to the machine frame by screws through the bottom of the frame into the cores. The coils produce the magnetic pull on the armature bar that makes the machine vibrate.

(3) Front Spring

(4) Contact Point

(5) Back Spring The back spring provides the return action and is generally made from a quality spring steel that is .018 to .025 thick. A slight bend in the back spring might be needed to provide the proper machine action.

(6) Armature Bar

The armature bar is steel or iron metal bar that the needle bar is attached to that the front and is held in place by the back spring

(7) Back Contact post

The back contact post is where the clipcord is connected. It is isolated away from the frame by means of plastic shoulder washers. A soldering lug is installed so that one end of the capacitor and one wire from the coils are soldered to it

(8) Front Binding post

The front binding post must be isolated away from the frame this is generally accomplished by the use of plastic shoulder washers. The top contact screw is fitted into the top contact and a plastic screw is used to keep the top contact screw from moving while the machine is running. A soldering lug for soldering the wire from the capacitor and the coil is attached to the top contact

(9) Top Contact Screw

The top contact screw passes through the post and is used to adjust the gap at the front of the machine. By screwing the screw up or down you can adjust the gap for a longer or shorter stroke

(10) Yoke

yokes at the rattle plates that the coils sit on. The yolks tie the magnetic fields of the core roles together at the bottom. If the frame is made from a suitable material York may not be necessary.

(11) Coil Cores

Coil cores are the centres of the coils, they are made from low carbon steel or iron

(12) Capacitor

The capacitor is connected to the soldering lugs at the top contact and the back contact and range in value from 10 Mf to 47 Mf or larger. Smaller value capacitors help make the machine run faster and are used on outlining machines where as larger value capacitors are used for shading machines. Capacitors help to reduced the spark at the contact point.

(13)

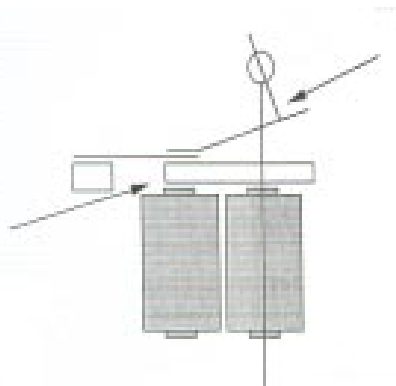
While there are other types of tattoo machines available and used today, probably the most popular style in North America is the double coil machine. One of its advantages is that it may be set to run directly off a 12v battery as well as electricity. To operate it successfully from a battery, some form of regulation needs to be used to control the current supply to the tattoo machine. This may be achieved with the use of rheostat with a rating of 25 watts or more and a resistance of 25 ohms. The rheostat acts as a buffer placed between the battery and tattoo machine, preventing the machine from running uncontrollably. To use a battery system, make sure the battery is fully charged at the beginning of use. As the charge drops, speed and hitting force of the machine drops too, affecting the performance of the machine and quality of the tattoo.

The other form of power for a tattoo machine is a DC power supply which, for the purpose of tattooing is usually rated 0-24 volts with a minimum output of 1 amp. Actually, the majority of tattoo machines don't really need this much power and will operate smoothly and effectively if correctly setup at a fraction of the power supply's capacity. High voltage and current draws will make the tattoo machine get very hot, to the point where you can not hold on to it. DC power supplies convert 110 / 220 volts AC (standard house electricly) to DC (direct current) battery current.

This much said, it is time to go onto the technicalities of what makes the machine run and needle bar go up and down. Briefly, the cycle of operation is as follows: current flows through the coils and creates a magnetic force which pulls the armature bar or flapper down. This pulls the contact away from the point, interrupting the flow of current which stops the magnetic force allowing the spring to return the contact to its position against the contact point. The current flows again and the cycle is repeated, rapidly, causing the up down vibration.

It's not hard to make the machine vibrate, but to do so with enough power and stroke, through a range of power calls, requires a lot of care and experimenting in the initial design of the tattoo machine, the coil cores must be of soft iron (cast), gap between the armature bar and top of the coil is important as well as the angle of spring. Silver or brass points are not essential when a capacitor is fitted to the machine, but will run smoother and help reduce spark, extending the life of the spring.

There are fine points of design which greatly affect the performance of this type of machine. For example the stiffness or gauge of the spring in relationship to the weight of the armature bar. The wire gauge, the number turns on coil, the coil core size and the gap between the top of coils and the armature bar are only a few of facts which determan how well a machine will run.



TUNING THE TATTOO MACHINE

For the sake of argument, let's assume the machine you're holding is correctly assembled and equipment used to supply power is in good working order

1) with machine connected to power source, turn top contact screw down until machine starts to buzz. Keep turning screw in or out until machine sounds smoother. Listen carefully because you will be able to ascertain the right amount of adjustment at the point by the sound of the machine.

2) If unable to get the machine to sound smooth by turning top contact, the reason may be improper front to back spring tension. By loosening rear spring and swinging armature bar with attached back spring to one side, gently pry armature bar in an upward direction to create a slight upward curve to the back spring. Reposition armature bar under front contact screw, tighten, and repeat step #1.

3) When adjusting a liner machine, the gap should be about .045". Gap is the distance between the tip of top contact screw and top of the contact point when the armature bar is down. A shading tattoo machine requires gap of about .060". Using the nickle, dime method shade the thickness of a nickel, liner thickness of a dime; not as accurate as feeler gauge but effective.

Some of the things that affect the way machine adjustments are made are: coils which may be 8, 10 or 12 wrap, the weight of armature bar, tension and gauge of metal used in manufacture of springs. Often forgotten but just as frequently the cause of problems are dirty or worn contact points that can create poor electrical connection. Use a small flat file or emery board to clean the contact point itself and see if that doesn't help.

The bottom armature bar and tops of coil core should be kept clean.

Adjusting the gap between the coil and armature bar to about .020"

You may want to experiment with different capacitors. The larger the mf value of capacitor the slower the machine will run. Larger value capacitors are often used on shaders. Liners can use capacitor 10 mf

Once adjustments are made and the machine is purring, keeping it that way is another matter without constant vigilance. It is necessary to fiddle with adjustments almost constantly for top performance. The time will come when springs need replacing or coils become weak. To remove these parts, first loosen appropriate screws and remove faulty parts. Situate the replacement part, always being sure to tighten down screws. Armature bar with attached front and back springs must always be evenly centered and in a straight line over coil centers.

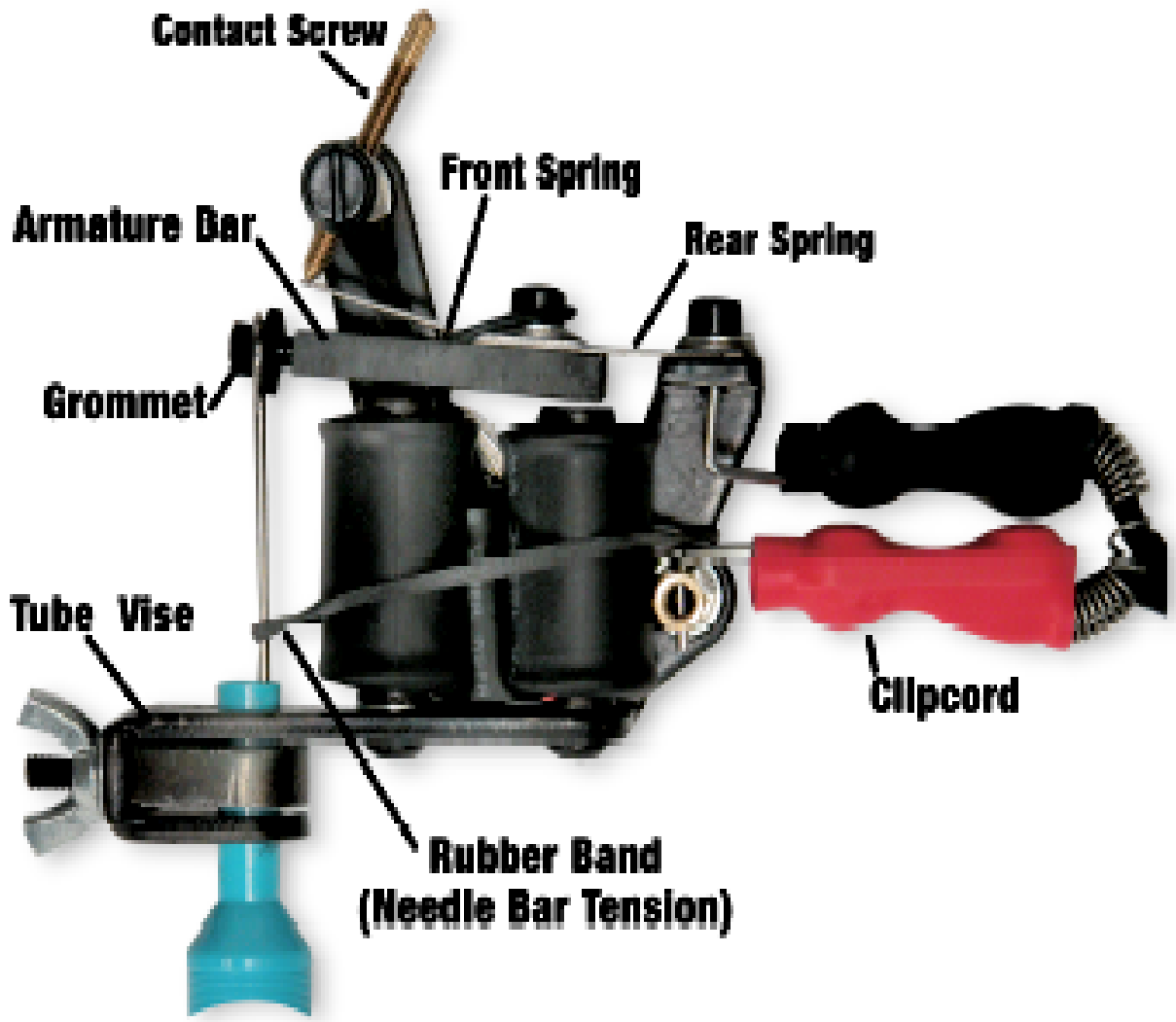
To perform at its best, it's essential that all screws be tight in the machine. Loose connections mean poor contact which translates into poor performance. Both AC and DC double coil machines usually have solid core canters which are electrically inefficient and generate heat by eddy current losses. Any type of coil tattooing machine can be made to tattoo better if a small piece of rubber (cushion / grommet) is fitted as a connection between the armature bar and needlebar. On a tattoo machine set to run off alternating current, brass or silver points aren't necessary as there is no spark involved.

Here are a few basic points to look for if the machine won't run.

- 1) check solder tags on contacts to be sure they're not touching machine frame anywhere.
- 2) check connections to back of machine.
- 3) check for broken or cracked front or back springs.
- 4) make sure coil screws are not loose.
- 5) check clip cord and foot switch to be certain they're working. Connect to another machine if possible.
- 6) is the needlebar correctly installed using an appropriate nozzle size?
- 7) is the power supply plugged in and turned on?
- 8) if the power supply is fused, make sure fuse isn't burned out.
- 9) check to see if contact point and tip of contact screw are clean. Replace contact point if necessary.

When the machine is properly adjusted, it should move smoothly when running over the skin. When gently lifted from the skin, as in the production of a controlled line, there should not be any ink spatter or an uneven line. It is a real art to properly adjust a tattoo machine and have it work well.

Now that the machine is running smoothly, tighten the nylon binding screw. This will set the machine's speed. Next, loosen the tube assembly and push the armature bar down against the coils. This brings the needle down to the end of the stroke. With the needle down, you can adjust the length the needle protrudes out of the nozzle by moving the nozzle or tube assembly until needle tips extends 1/16" out of the nozzle. Tighten the tube assembly, release the armature bar and the needle should retract into the nozzle. While tattooing, needles should be about even with the longest part of the nozzle when the machine is not running EXCEPT with flat shading



Contact Screw

Armature Bar

Grommet

Tube Vise

Front Spring

Rear Spring

**Rubber Band
(Needle Bar Tension)**

Clipcord



**Load Needle Bar with
Loop Opening Facing Left.**

**Adjust Tube so needle points
Extend 1/16" over Tube Tip** →