June 13, 1944. H. S. JONSSON 2,351,519

MARKER

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Fig. 1.

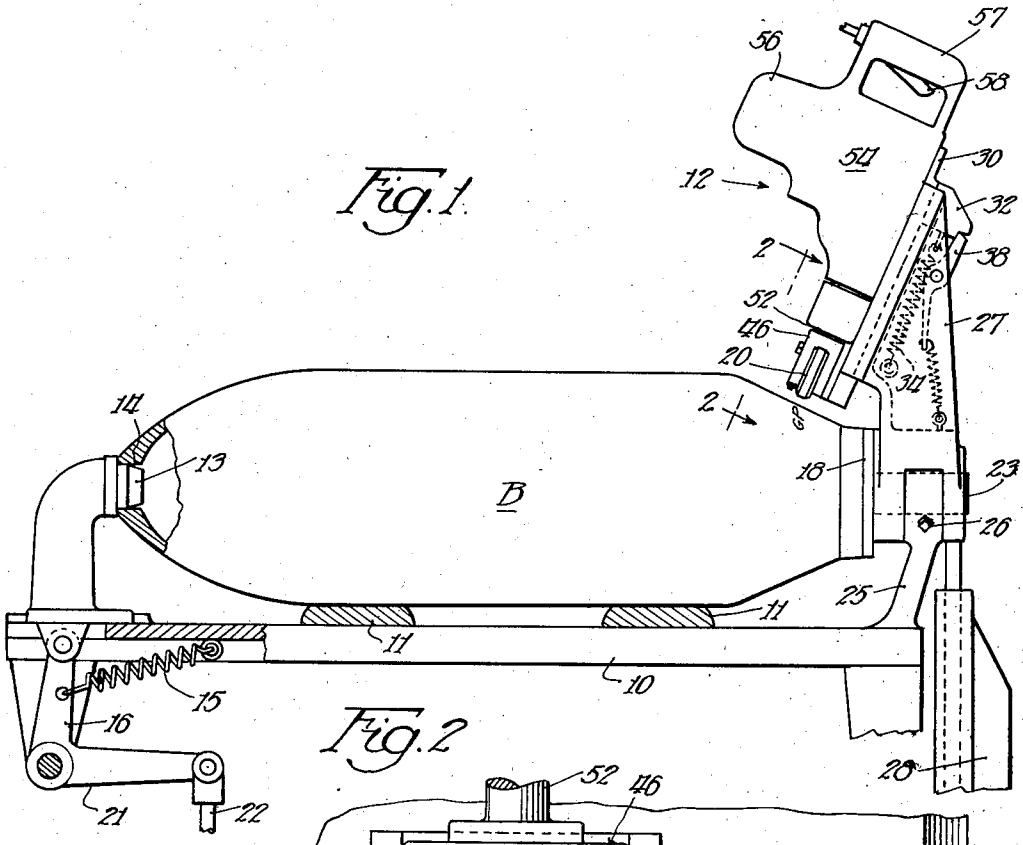
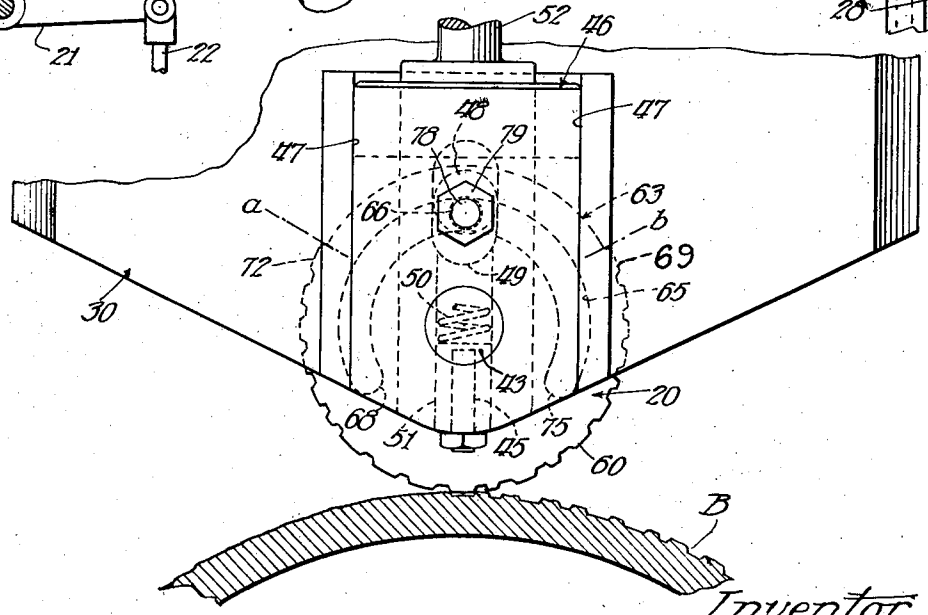


Fig. 2.



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Fig. 4.

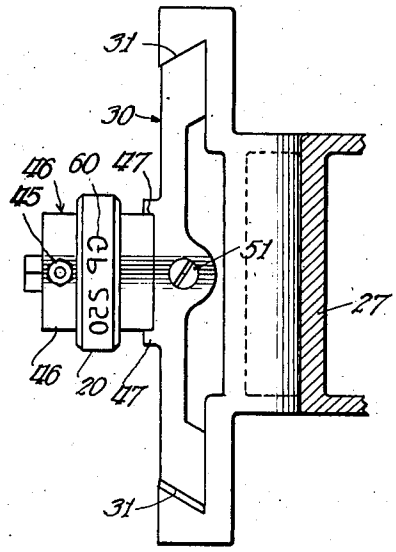


Fig. 3.

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Fig. 5.

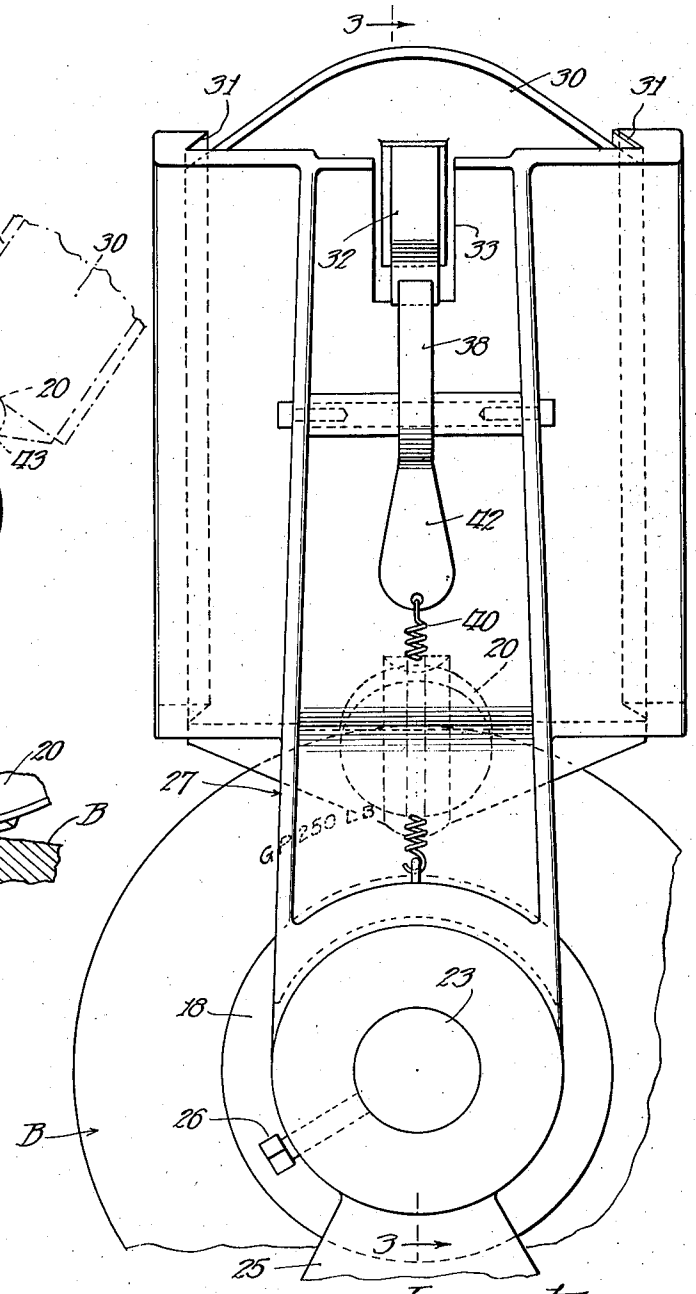


Fig. 6.

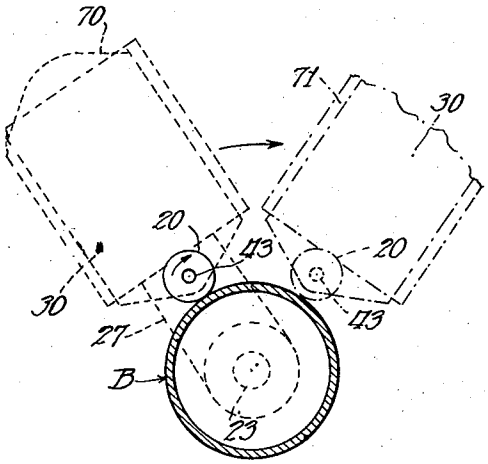


Fig. 7.

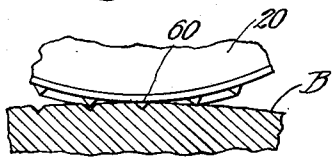
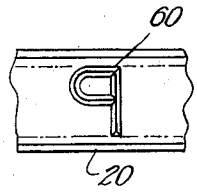


Fig. 8.



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UNITED STATES PATENT OFFICE

2,351,519

MARKER

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Application July 30, 1942, Serial No. 452,926

17 Claims. (Cl. 101—4)

The present invention relates to a marking machine devised for the purpose of inscribing the surface of an object with an appropriate legend for identifying said object. The machine of the present construction is more particularly for use in connection with marking surfaces of a roughened nature although the machine is equally adaptable to smooth or machined surfaces. It is obvious that numerous such objects having roughened surfaces may be marked with a machine of the present invention, but the more particular adaptation of the present device is for use in connection with marking identifying legends upon the circular surface of a bomb casing, the latter presenting a surface which is fairly rough and not machined, since this is not required in casings of this type.

In performing the above noted operations, it is one of the objects of the present device to provide inscription mechanism bearing the characters of the legend to be engraved upon the surface of the bomb casing and to utilize proper guiding mechanism for said inscription wheel and to incorporate a vibratory hammer mechanism which will bodily move the inscription wheel and substantially hammer the engraved characters into the surface of the metal. This operation is progressively performed as the inscription wheel is rolled over the surface of the bomb casing and any irregularities which may be and are upon such surfaces will not interfere with obtaining the proper and completely engraved characters with the device of the present invention.

Other objects such as maintaining the inscription wheel in engraving contact with the piece of work and the use of releasable latch means for holding the inscription wheel and its associated mechanisms out of operative position along with other objects shall hereinafter appear in the more detailed description having reference to the accompanying drawings.

In the drawings:

Fig. 1 is a side elevational view of the marking machine for engraving a bomb casing as related to a bomb assembly line.

Fig. 2 is a view of the inscription wheel and a portion of its associated mounting mechanism as viewed along the line 2—2 in Fig. 1.

Fig. 3 is a transverse vertical sectional view of the machine as taken along the line 3—3 in Fig. 5.

Fig. 4 is a bottom view of a portion of the machine as taken along the line 4—4 in Fig. 3.

Fig. 5 is a rear view of said marking machine.

Fig. 6 is a diagrammatic view illustrating the rocking action of the inscription wheel supporting mechanism which is employed for marking the bomb casing.

Fig. 7 is an enlarged sectional view through a portion of the bomb casing and indicating the manner in which the engraving wheel indents said casing, and

Fig. 8 is a fragmentary face view of a portion of the inscription wheel illustrating one of the characters thereon.

Referring to Fig. 1 of the drawings, a suitable table 10 with appropriate guiding members 11 is utilized for positioning the bomb casing B in proper alignment with respect to the marking machine indicated generally at 12. The bomb casing B is rolled substantially into alignment with the machine 12 from a continuous assembly line and is held in operative relation to said machine by any suitable means such as the tail piece 13 mounted on table 10 and which is adapted for entering the opening 14 in said bomb casing by means of spring 15 acting through a suitably pivoted arm 16. The tail piece 13 urges the bomb casing endwise so that the front open end 17 of the bomb casing as best shown in Fig. 3 is held upon and against the work positioning member 18 suitably machined and shaped for properly receiving and holding the front end of the bomb-casing in a predetermined relation with respect to the inscription wheel 20 of the marking machine 12. The arm 16 forms a portion of the bell crank 21 which may be operated by a foot pedal or other means through the push rod 22 connected to the bell crank 21 in any desired manner.

Referring now to Fig. 3, it is to be noted that the work positioning member 18 is secured to a shaft 23 and the latter is held against movement within the bore 24 of the bracket 25 by means of a set screw 26 shown in Fig. 5. The bracket 25 is supported from the table 10 and may be connected therewith in any desirable manner. A main supporting member 27 is pivotally carried on the shaft 23 and provides means for supporting the engraving wheel mechanism in operative relation with respect to the bomb casing B. The support 27 is also provided with a suitable counterweight 28 of such weight and adjustable and connected so as to normally maintain the engraving machine support and its associated mechanisms in upright position and ready for use. It should also be noted that the support 27 can be rocked about the axial center of the shaft 23, and the latter is also in line with the

axial center of the bomb casing as shown in Figs. 1 and 3, whereby the support **27** when rocked about the shaft **23** will move the inscription wheel **20** along the circular surface of the bomb casing B.

In Figs. 3 and 4, a carrier **30** is slidably mounted in the guideways **31** formed on the support **27** and the latch member **32** is secured to the carrier **30** and projects through an opening **33** in the supporting member **27**. A tension spring **34** is interposed between the eyelet **35** secured to the support **27**, and the ring member **36** connected with the latch member **32**. The spring **34** as viewed in Fig. 3 will maintain the marking machine and its inscription wheel **20** in operative contact with the surface of the bomb casing whenever said marking machine is being used for engraving the surface of said casing. By moving the marking machine upwardly against the action of the spring **34**, the trip member **38** will engage under the end **39** of the latch **32** through the action of the spring **40** thereby maintaining the marking machine and its inscription wheel in the raised and latched position as indicated in Fig. 1. To release the marking machine and to place the inscription wheel in operative relation against the surface of the bomb casing, the operator need only press the end **42** of the trip member to rock the same about its pivotal support as best shown in Figs. 3 and 5, whereby the spring **34** again becomes operative to move the carrier and its associated mechanisms downwardly with the wheel **20** against the surface of the piece of work.

The inscription wheel **20** is rotatably mounted on a shaft **43** and fastened by the screw **45** in the bifurcated mounting member **46**. The mounting member **46** is slidably guided upon the carrier **30** between the guideways **47** as shown in Figs. 2 and 3, so as to be relatively movable with respect to the carrier, and a pin **48** projects into a recess **49** in the carrier **30** with a spring **50** interposed between the pin **48** and an adjustable spring tensioning screw **51** whereby the mounting member **46** and its inscription wheel **20** will be urged upwardly relative to the carrier **30**. A guide rod **52** in the form of an actuating member forms a contiguous part of the mounting member **46** and is slidable in a sleeve **53** secured and carried in the front end of a vibratory hammer mechanism **54** to be contacted and actuated by the hammer **55** of said mechanism as illustrated in Fig. 3.

The vibratory unit or impulse hammer mechanism **54** is more or less diagrammatically indicated in Figs. 1 and 3 and may be of any known construction either electrically operated or pneumatically operated or in any other appropriate manner. In the present construction the vibratory impulse mechanism is enclosed in the housing indicated at **56** in Figs. 1 and 3, which housing **56** is provided with a handle **57** having a suitable trigger switch **58** for conveniently starting and stopping the device as desired by the operator or when he takes hold of the handle **57** and releases the same, respectively, during the operation of the marking machine. In the device illustrated, by way of example, the hammer **55** is reciprocated at high speed against the end of the rod **52** whereby a reactionary hammer action is transmitted to the mounting member **46** and its associated inscription wheel **20** to intermittently force the latter against the piece of work with great rapidity to cause the characters **60** on the inscription wheel to indent the surface of the bomb casing and to mark the same in the manner sought. During the downward hammer action of the mounting member **46** and its inscription wheel **20**, the spring **50** is compressed by the pin **48** and in the intervals between the hammer blows imparted to rod **52** by the hammer member **55**, the spring **50** will force the mounting member up against the end **62** of the vibratory hammer sleeve member **53**.

The inscription wheel **20** as best shown in Fig. 2 is provided with a substantially smooth peripheral surface having the characters **60** extending thereabout substantially from some point *a* to a second point *b* with the remainder of the surface of the wheel **20** remaining smooth as at **63**, and therefore, producing no effect upon the bomb casing B when this smooth surface is brought into contact with said casing. In order to position the inscription wheel **20** in its proper starting relation for engraving the characters disposed on the periphery thereof, a suitable concentric slot **65** is milled into the side of the wheel which is engaged by a plug **66** shown in Figs. 2 and 3. By disposing the marking machine in inoperative position as indicated in Fig. 1, the operator may revolve the wheel **20** by hand until the end **68** of the slot **65** contacts the plug **66** whereby the first letter **69** of the inscription characters will be positioned in its starting relation which will be substantially in axial alignment with the rod **52** and the actuating hammer **55**. This will be the initial engraving position of the machine and the operator may then rock the machine into the dotted position **70** indicated in Fig. 6 and by releasing trip **38** and by operating the trigger switch **58** can slowly rock the machine into the dot and dash line position indicated in Fig. 6 at **71** to roll the inscription wheel across the surface of the bomb casing and to constantly vibrate said inscription wheel with rapid blows through the hammer mechanism hereinbefore described. Obviously, the inscription may be started anywhere about the periphery of the bomb casing so long as the marking machine can be rocked through the required angularity to indent the entire inscription into the bomb casing which operation shall be eventually performed by habit as the operator becomes accustomed to the action of the machine and the length of the inscription. As shown in Fig. 2, when the last character or letter **72** has been engraved into the bomb casing, the smooth surface **63** of the inscription wheel shall then be brought into contact with the bomb casing and after a slight additional movement of the machine, the end **75** of the slot **65** will then contact plug **66** to prevent further rotation of the wheel **20** and to guard against a repetition of the inscription of the legend carried on the surface of the wheel **20**.

In connection with the operation of the machine, the operator will be able to judge reasonably accurately from the variation in the sound of the operating machine just when the last or final letter or character **72** in Fig. 2, has been engraved into the bomb casing, the difference in sound occurring when said smooth surface **63** of the inscription wheel is vibrated against the surface of the bomb casing after the letters have been cut into said surface. Visible means might also be employed to indicate the completion of the inscription to an operator such as coloring the inscription wheel, etc.

In order that the inscription wheel **20** shall

be held in its initial position with the first legend character 69 in its starting relation, and in order that the wheel 20 will be maintained in any intermediate radial position with respect to its shaft 45 in the event that the machine 12 is released and brought into inoperative position, the plug 66 also provides a frictional means through the action of a spring or the resilient plug as here shown at 77 which is adjustably urged against plug 66 by means of the threaded stud 78, the latter being locked in place by the nut 79.

When the device is in operative position and the engraving of the characters 60 is being accomplished, the interlocking of the characters within the previously indented impressions formed thereby in the surface of the bomb casing will cause a reaction against the inscription characters, whereby the inscription wheel 20 shall be automatically rotated to progressively advance each of the consecutive characters into operative alignment with respect to the rod 52 and the vibratory hammer 55 to induce a positive and complete inscription of the surface of the bomb casing regardless of the normal irregularities of the surface of said casing and will produce a clear cut legend on said piece of work which shall be plainly legible. Also during the operation of the device, the spring 34 will urge the entire hammer unit downwardly and hold the inscription wheel in operative contact with the surface of the piece of work, while the marking machine is being rocked or rotated about its pivotal guide member comprising the shaft 23, which action is independent of the high speed vibratory action of the hammer 55 upon the rod 52 transmitting the hammer impulses at the same speed and frequency to the inscription wheel 20.

The device herein described may be employed for inscribing flat surfaces as well as curved surfaces and the surfaces may or may not be rough as the case may be. It is apparent, therefore, that the device of the present invention may be adapted to marking numerous objects and that the inventive concept thereof should not be limited to the particular illustrations shown and described, and that the construction and use of the same shall not be limited except as shall be determined by the breadth and scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A marking machine comprising a movable carrier unit mounted for movement in a definite path and paralleling the surface of the work, an inscription member movably connected with said unit, and vibratory mechanism connected with said carrier unit and cooperating with said inscription member to forcibly actuate the latter toward the work whereby said member is adapted for engraving a piece of work contacted thereby.

2. A marking machine comprising a movable carrier unit, an inscription member movably mounted on said unit, vibratory mechanism connected with said carrier unit and cooperating with said inscription member to forcibly actuate the latter toward the work whereby said member is adapted for engraving a piece of work contacted thereby, a support having means to guide the same to move in a definite path relative to the work, said support having means for supporting said carrier and including work positioning means, said support being operable to cause said inscription member to follow the contour of said piece of work.

3. A marking machine comprising a movable carrier unit, a round rotatable inscription member having inscription characters circumferentially disposed about its periphery, said inscription member being connected with said unit and bodily movable relative thereto, and vibratory mechanism connected with said carrier unit and cooperating with said inscription member to forcibly actuate the same toward the work whereby said member is adapted for engraving a piece of work contacted thereby.

4. A marking machine comprising an inscription member having inscription characters disposed circumferentially thereon and freely rotatable within predetermined limits, and guidable means for supporting said member in engraving relation with respect to a piece of work, said guidable means having mechanism for bodily moving said inscription member intermittently against the surface of said piece of work.

5. A marking machine comprising a main support having work positioning means, and movable in a definite path with respect to the work, a carrier unit movably mounted on said support, an inscription member connected with said carrier unit and movable toward and away from contact with a piece of work, impulse mechanism coacting with said inscription member in a direction toward the work to induce forceful impinging motion to said member, and releasable cooperative means for disposing said inscription member in operative relation with respect to said piece of work and to hold said member in inoperative position spaced from said piece of work respectively.

6. A marking machine comprising a movable main support having work positioning means, a carrier unit movably mounted on said support, a vibratory engraving member vibrating in a direction toward and away from the work and connected with said carrier unit, and cooperable supporting and guide means for movably mounting said main support to move in a definite path with respect to the work, whereby to cause said engraving member to follow the surface of said piece of work.

7. A marking machine comprising a movable main support having work positioning means, and mounted for moving in a definite path and paralleling the surface of the work, a carrier unit movably mounted on said support, a vibratory arcuate engraving member vibrating in a direction toward and away from the work and connected with said carrier unit, cooperable supporting and guide means to movably mount said main support and adapted for guiding said support to cause said engraving member to follow the contour of said piece of work, and means coacting between said support and said carrier unit to resiliently urge said carrier unit toward the work, whereby to maintain said engraving member in operative contact with the surface of said piece of work.

8. A marking machine comprising a movable main support including work positioning means, and mounted to move in a definite path with respect to the work, a carrier unit movably mounted on said support, a vibratory arcuate engraving member vibrating in a direction toward and away from the work and connected with said carrier unit, cooperable supporting and guide means to movably mount said main support and adapted for guiding said support to cause said engraving member to follow the contour of said piece of work, and cooperative means between

said main support and carrier unit operatively connected to maintain said engraving member in working contact with the surface of said piece of work and to provide releasable means for maintaining said engraving member out of working engagement with said work surface respectively.

9. An engraving mechanism comprising a rotatable inscription wheel having inscription characters circumferentially disposed thereon, a supporting member for said wheel, movable means for positioning said wheel and its supporting member in operative relation to a piece of work, a reciprocable hammer for bodily driving said wheel and wheel support in one direction against said piece of work, and means for urging said wheel and wheel support in the opposite direction toward said hammer between hammer blows.

10. An engraving mechanism comprising a round inscription wheel having raised engraving characters on the peripheral surface thereof, mounting means for rotatably supporting said wheel, vibratory mechanism to induce limited vibratory impact to said inscription wheel in a direction toward the work, whereby said engraving characters are caused to be indented into the surface of a piece of work, and guide means for movably supporting said wheel mounting means and having work positioning means, said guide means comprising resilient means for urging said inscription wheel into engraving contact with the surface of said piece of work and latch means to releasably hold said wheel out of contact with said work surface, and having cooperative supporting and guide members for guiding said inscription wheel to follow along the surface of said piece of work whereby said inscription wheel is caused to move over the surface of said work and to rotate by the progressive interlocking reaction of each successive character of said wheel being held within the character impression made thereby in the surface of said piece of work as said wheel is being vibrated.

11. An engraving mechanism comprising a rotatable inscription wheel having engraving characters on the peripheral surface thereof, mounting means for rotatably supporting said wheel, vibratory mechanism for imparting limited bodily movement to said wheel toward a piece of work to cause the characters thereon to indent the surface of the piece of work, frictional means operatively related to said wheel to retard the free rotation of said wheel, limit stops for setting said wheel into its initial starting position in order to engrave the full inscription upon said piece of work, and cooperative relatively movable supporting and guiding mechanisms connected with said mounting means and wheel, and adapted to cause the wheel to follow the surface of said piece of work and to be bodily held in engraving contact with the surface of the same.

12. An engraving mechanism utilized for inscribing a piece of work having a substantially circular surface, comprising an inscription wheel with raised engraving characters thereon, mounting means for rotatably carrying said wheel, vibratory mechanism for imparting limited bodily movement to said wheel in a direction toward the piece of work whereby said characters indent the circular surface of said piece of work, and pivotal supporting means disposed to rock on the axial center line of said piece of work and to support said mounting means and the wheel in operative relation to said work and to move said wheel to follow the contour of said work.

13. An engraving mechanism utilized for inscribing a piece of work comprising an inscription wheel having raised engraving characters about a portion of the periphery thereof with the remaining portion of smooth contour, cooperative means for rotatably mounting said wheel means to bodily vibrate the wheel mounting toward the work to cause said characters to indent said piece of work, and rotational limiting means for said wheel for setting the same to dispose said wheel in its initial engraving position and to stop additional rotation thereof beyond a predetermined limit, respectively, said latter limiting means acting to stop rotation of said wheel when the smooth contour thereof is in contact with the surface of the piece of work.

14. An engraving mechanism utilized for inscribing a piece of work having a substantially roughened surface, comprising a bodily movable and rotatable arcuate engraving member, movable supporting means for guiding said engraving member to roll along the work and including vibratory mechanism to vibrate the same toward and from the work, and means for maintaining said engraving member in operative contact with said roughened surface during the operation thereof.

15. The method of engraving a surface of a roughened nature which consists of positioning said surface, providing characters to form a raised inscription on a smooth circular object, rolling said smooth object over and in contact with said roughened surface, and simultaneously inducing bodily vibration of said object in a direction at right angles to the axial center of said object and in a direction normal to particular characters of said raised inscription which is in contact with said surface.

16. The method of engraving a surface of a roughened contour which consists in positioning said surface against movement, providing a plurality of connected engraving characters in sequential order for consecutive face contact with said surface, gradually moving said characters into face contact with said roughened surface, and then bodily vibrating all of said characters in the general direction of said surface and substantially at right angles thereto to cause the characters that are in immediate contact with said surface to indent and engrave the same.

17. An engraving mechanism for engraving round objects, comprising in combination a work holder, a rotatable inscription wheel having raised engraving characters on the peripheral face thereof, mounting means for rotatably supporting the wheel, a carrier unit for said wheel mounting and wheel, vibratory mechanism carried by said carrier unit for imparting limited bodily movement to said wheel mounting and therewith to the wheel in a direction toward the work, yieldable means engaging said wheel mounting to move the wheel away from the work, and a rockable support on which the carrier unit is mounted, the axis of movement of the support being coaxial with the axis of the work, and said wheel being disposed in the carrier unit in position to be impinged upon the work while the support is being rocked in one direction.

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