April 8, 1958 J. F. OCHWAT ET AL 2,829,590

PRINTING MACHINE

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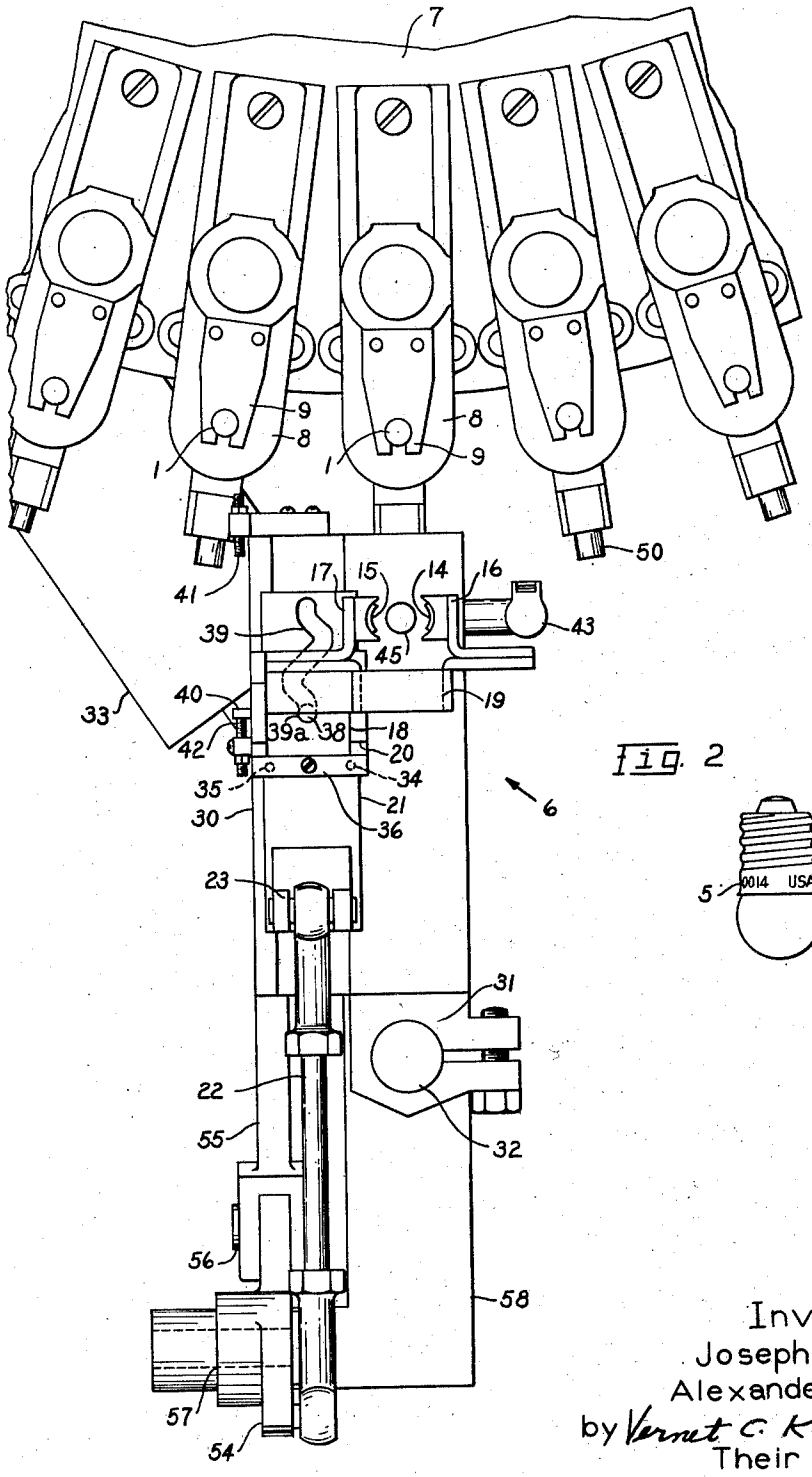


fig. 1

fig. 2

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Fig. 1a

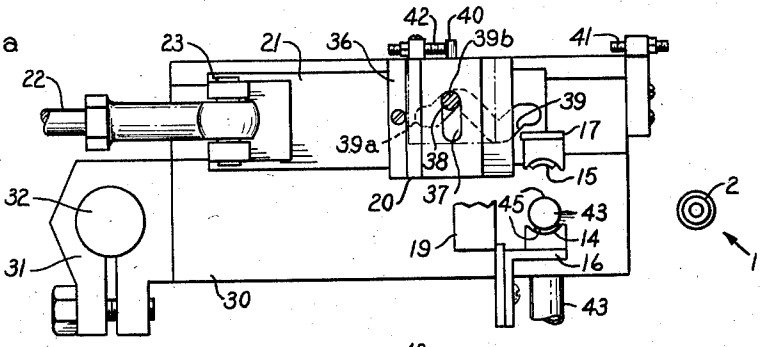


Fig. 1b

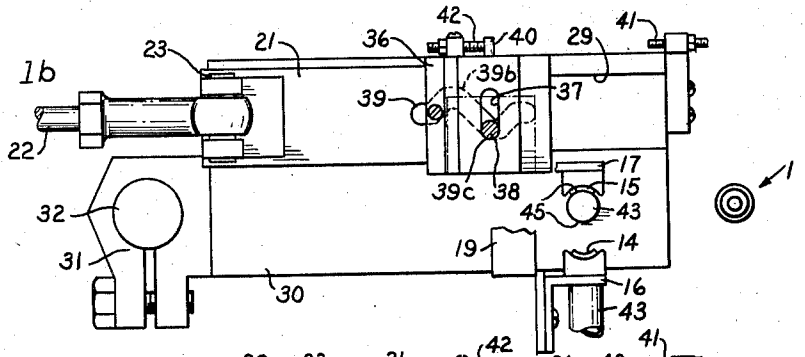


Fig. 1c

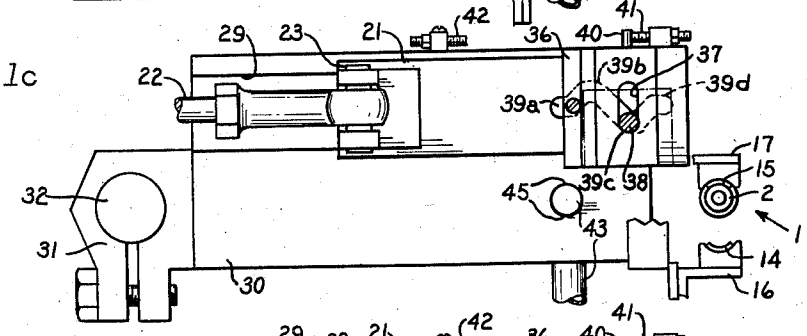
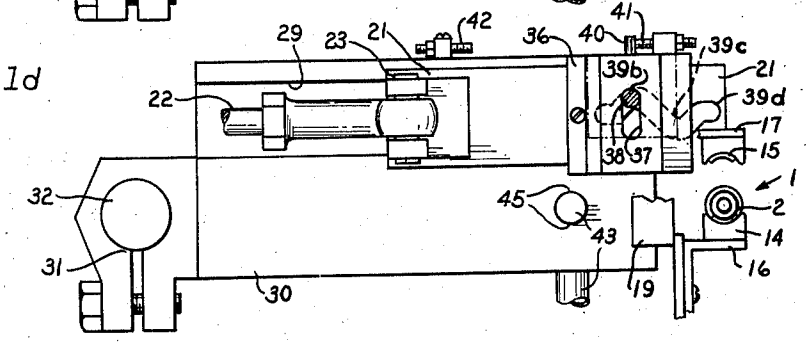


Fig. 1d



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Fig. 3

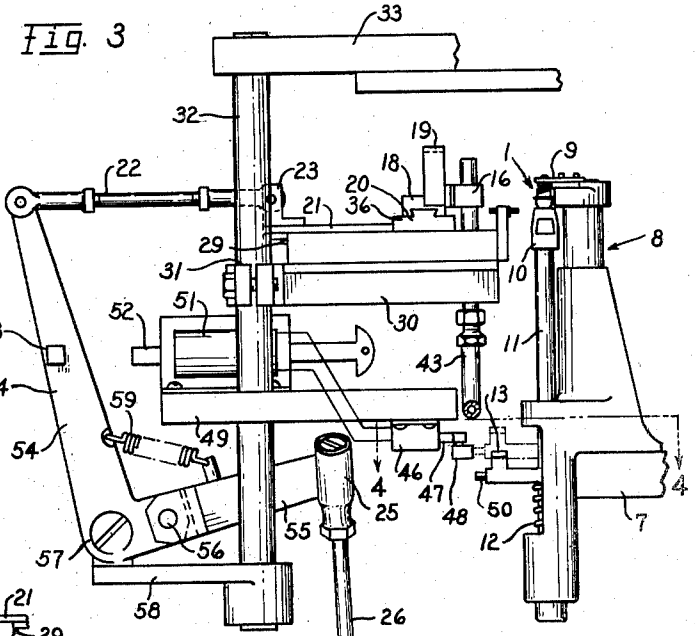


Fig. 5

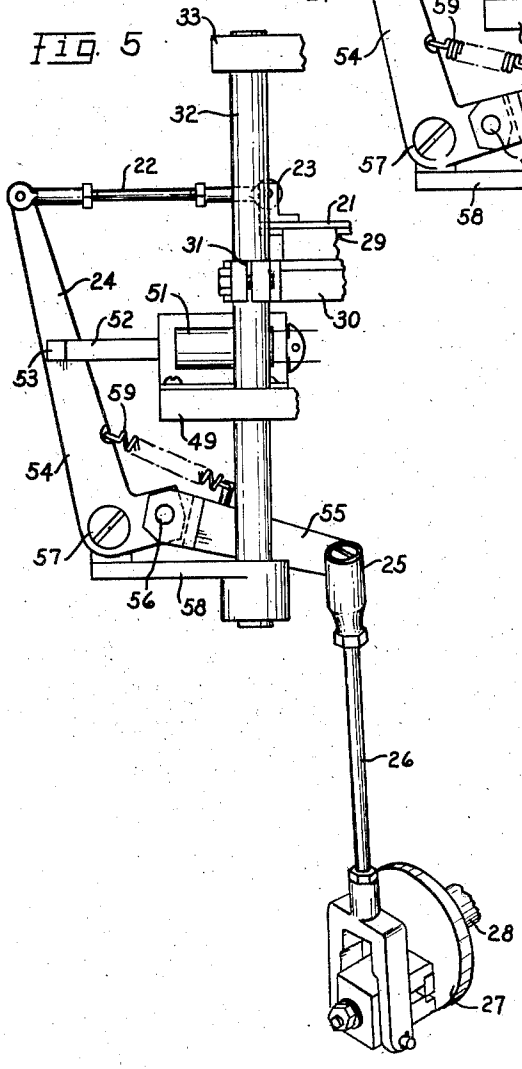
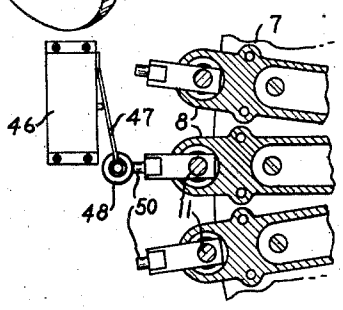


Fig. 4



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Fig. 6

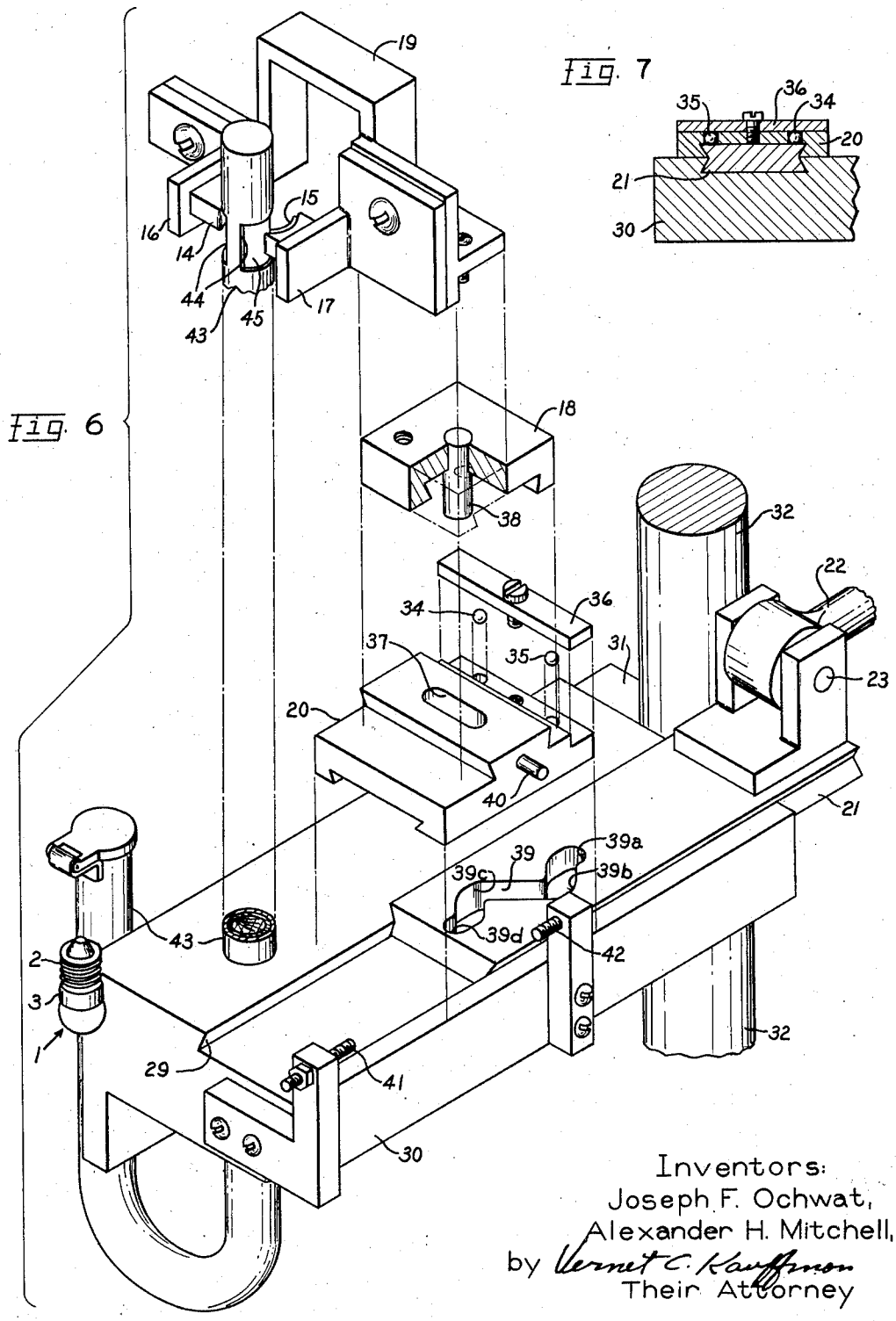


Fig. 7

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PRINTING MACHINE

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Application October 11, 1954, Serial No. 461,706

5 Claims. (Cl. 101—44)

This invention relates generally to the printing of characters on cylindrical objects such as the base shells of incandescent lamps. More particularly, it relates to a mechanism for automatically printing identification characters on the cylindrical base shells of miniature electric lamps and which is adaptable to operate in conjunction with automatic lamp basing machinery.

The great majority of commercial lamps are manufactured by means of automatic machinery, generally of the indexing type wherein the manufacturing operations are performed upon the lamps at spaced work stations. The lamps are advanced or indexed from one position to the next by means of suitable conveyor systems which operate in a series of intermittent or discontinuous steps. For example, the lamps may be held in suitable holders mounted on the periphery of a rotary turret and the manufacturing operations may be performed by mechanical operators or mechanisms disposed around the turret at the various stations and adapted to move radially inward upon the lamps when they are indexed into position.

To be economically feasible, a lamp marking or printing mechanism must be capable of operating in conjunction with such lamp basing machinery and produce smooth, even, and legible identification characters.

In the case of miniature incandescent lamps, the printed identification characters must cover substantially the whole periphery of the base shell in order to be legible. The mechanism heretofore preferably employed for printing characters around the periphery utilizes a rolling operation which has the disadvantage of producing considerable wear upon the marking stamp. As the stamp develops wear it often produces smeared uneven characters.

Therefore, it is an object of our invention to provide a new and improved printing mechanism for applying characters of substantial size around the periphery of objects wherein the characters must cover a substantial portion of said periphery.

Another object of our invention is to provide a mechanism for printing characters on the base shells of electric lamps which is adapted to operate in conjunction with automatic lamp basing machinery.

Still another object of our invention is to provide a mechanism which will print all of the desired characters at one work station of the automatic lamp basing machine without the use of a rolling mode of operation.

Further objects and advantages of our invention will appear from the following description of a species thereof and from the accompanying drawings.

Fig. 1 is a fragmentary plan view of a lamp finishing machine utilizing a base printing mechanism embodying the invention.

Figs. 1*a* to 1*d* are fragmentary plan views of the main elements of the printing mechanism showing the sequence of motions in printing a lamp base.

Fig. 2 is an enlarged side elevation view of a miniature incandescent lamp showing the type of markings or characters which it is desired to imprint on the base of the lamp.

Fig. 3 is a side elevation view of the printing mechanism shown in conjunction with a single lamp holder and the interlock mechanism.

Fig. 4 is a fragmentary plan section taken on the line 4—4 of Fig. 3.

Fig. 5 is a side elevation view of the printing mechanism and of the interlocking mechanism in operation.

Fig. 6 is an "exploded" pictorial view of the principal elements of the printing mechanism.

Fig. 7 is a transverse section showing how a shoe retains a pair of balls to frictionally lock the intermediate slide to the carriage slide.

A preferred embodiment of our apparatus is adapted to operate in conjunction with a miniature lamp basing machine of the indexing type. In accordance with the invention, the characters are printed on the cylindrical base shells by alternately pressing a pair of opposed stamps, suitably inked, against opposite sides of the base. The stamps are mounted on a pair of arms so as to be supported in spaced mutual facing relationship on a cross-slide. Initially a carriage slide, carrying a secondary slide upon which is mounted the said cross-slide, moves longitudinally toward the base shell, which is supported in fixed position relative to the printing mechanism during the operation thereof, until the stamps are disposed on opposite sides of the base shell, whereupon a stop pin on the secondary slide engages a stop to prevent further forward longitudinal movement of the secondary slide and associated elements. Further forward longitudinal movement of the carriage slide is then adapted, by cam-slot means in the carriage slide cooperating with a pin follower extending subjacently from the cross-slide, to impart transverse motion to the cross-slide thereby bringing the stamps alternately into contact with opposite sides of the base. The carriage slide is then withdrawn rearwardly until the stamps are disposed on opposite sides of an inking pad whereupon the stop pin on the secondary slide engages another stop to arrest the further rearward movement of the secondary slide and associated elements. Further rearward movement of the carriage slide then again imparts transverse motion to the cross-slide by the said cam-slot and follower pin means, to thereby bring the stamps alternately into contact with the inking pad ready for the next printing operation.

Referring to Fig. 2, an incandescent lamp **1** there shown consists of a screw type base **2** having a cylindrical shell portion **3** which is cemented to a glass envelope **4**. A mechanism **6** (Fig. 1) embodying our invention is adapted to print suitable identification characters **5** on the cylindrical shell portion **3** of the base **2**; however, it is to be understood that such a mechanism can be used to print characters on other cylindrical objects.

The printing mechanism **6** is designed for operation in conjunction with a lamp basing machine. Referring to Fig. 1, the printing mechanism **6** is shown in position for operating on an incandescent lamp **1** held in a holder **8** which may be mounted on a rotary turret type lamp basing machine **7**. The turret carries the holder through a series of work stations where the glass envelope **4** is cemented to the base **2** and the lead wires are soldered to the base terminals; subsequently, the holder is indexed to a position radially aligned with the printing mechanism **6** as shown in Fig. 1 for a predetermined interval of time during which the printing mechanism **6** performs its operation upon the lamp **1**.

The details of the lamp holder **8** may be seen in Fig. 3 where the lamp **1** is shown to be held with vertical resilience, base up, between a receiving plate **9** and a suitable fixture **10** mounted on a spring-loaded spindle **11**. The spring **12** may be compressed by pushing down on

a bracket 13 thereby facilitating removal of the lamp 1 at any station.

Referring to Figs. 1 and 6, the essential functional elements of the printing mechanism 6 comprise a pair of stamps 14 and 15, mounted on a pair of cooperating arms 16 and 17, respectively, a cross-slide 18 to which the arms are attached by a bracket 19, an intermediate slide 20 upon which said cross-slide 18 is mounted, and a carriage 21 which carries said intermediate slide 20.

The carriage 21 is reciprocated by means the components of which can be seen in Fig. 3. They comprise a connecting link 22 hinged at 23 and attached to one end of a rocker arm 24, a connecting rod 26 linking the rocker arm 24, by a ball and socket connection 25 at its other end, to a cam 27 mounted on a cam shaft 28 of the lamp basing machine 7.

The carriage 21 is slidably mounted in a dovetail guideway 29 formed in a stationary part of an apparatus frame 30 which is secured by a clamp portion to a vertical rod 32 supported by a bracket 33 from the basing machine 7.

Referring to Fig. 6, where the details of the printing mechanism proper may more clearly be seen, the elements will be described in detail. It is to be understood that the lamp 1 is held in holder 7. The stamps 14 and 15 are adapted to move longitudinally with the carriage 21. They are also adapted to move transversely in respect to the longitudinal center line of the carriage 21. The intermediate slide 20 is normally frictionally locked to the carriage 21, in order to move with the carriage 21, by means of balls 34 and 35 which are held in place by a shoe 36 (Fig. 7). The intermediate slide 20 is provided with a slot 37 through which a cam follower pin 38 subjacently extends from the cross-slide 18 to a cam-slot 39 in the carriage 21. This arrangement allows all of the elements mounted on the carriage 21 to move with the carriage 21 until a pin 40 mounted in the intermediate slide 20 engages stops 41 or 42. These stops 41, 42 arrest the longitudinal motion of the intermediate slide 20; thereafter the carriage overcomes the frictional tension of the balls 34, 35 and further longitudinal motion of the carriage 21 imparts transverse motion to the stamps 14, 15, in unison and alternately in opposite directions, by means of said cam-slot 39 and follower pin 40.

The frame 30 has mounted at its forward end, in radial alignment with the lamp to be printed, an ink reservoir 43, which has horizontal slots 44 to expose the ink pad 45. This ink pad 45 is of the same diameter, preferably, as the cylindrical shell portion 3 of base 2. By virtue of the cam-slot 39, the stamps 14 and 15 alternately move in, upon retraction of the carriage 21, to contact the ink pad 44 and pick up ink for the next printing operation.

In order to prevent excessive accumulation of ink on the printing stamps when an empty holder is indexed into the printing station, interlock controls are provided. The principal elements of the interlock controls, which may be seen in Figs. 3, 4 and 5, are a normally open switch 46 having an arm 47 with a roller 48 mounted thereon. The operation of the switch 46 is correlated to the absence or presence of a lamp within the holder 8 by the fact that presence of a lamp results in the spindle 11 of the holder 8 being depressed. The switch 46 is supported and positioned on a bracket 49 so that if a lamp is not in the holder 8, a stud 50 of the spindle 11 contacts the roller 48, closes the switch 46 (Fig. 4) energizing a solenoid 51 also supported on the bracket 49. The solenoid plunger 52 engages a stop 53 of vertical leg 54 of rocker arm 24 pivoted at 57 (Fig. 5) thereby preventing arm 54 from pivoting and reciprocating the carriage 21.

Since the cam shaft 28 of the lamp basing machine 7 is driven at constant angular velocity, means are provided to interrupt the motion so as not to damage any elements of the mechanism when the vertical leg 54 is locked. This is accomplished by hinging the horizontal leg 55 at 56 so that the horizontal leg 55 will pivot about 56 instead of the normal pivot 57 supported on a bracket 58. The two legs 54 and 55 of the rocker arm 24 are connected by a spring 59, said spring 59 having a tension greater than the sliding friction of the carriage 21 to allow the arms 54 and 55 to function as a unit when the interlock mechanism is not in operation.

The operation of the printing mechanism 6 during a complete cycle will now be described with reference to Figs. 1 to 1*d*. In Figs. 1*a* to 1*d* it will be understood that lamp 1 is held in holder 7 as shown in Fig. 1. In Fig. 1 the pin 40 of intermediate slide 20 has engaged the stop 42; the stamps 14 and 15 are in a neutral position wherein they are equally spaced about the inking pad 45 and ready to be inked. The backward longitudinal movement thus being arrested, side motion is imparted to the cross-slide 18 by reason of the follower pin 38 moving in cam-slot 39 from 39*a* to 39*b* and brings stamp 14 into contact with the ink pad 45 to pick up ink when the carriage 21 is moved backward as shown in Fig. 1*a*. When the carriage continues to move backward to a position shown in Fig. 1*b*, the follower pin 38 moves from 39*b* to 39*c* thus retracting stamp 14 and bringing stamp 15 into contact with the ink pad 45 to pick up ink. Further backward movement of the carriage 21 moves the follower pin 38 from 39*c* to 39*d* and the stamps 14 and 15 into a neutral position again.

The carriage 21 then moves longitudinally forward toward the lamp 1 carrying with it the intermediate slide 20 and associated elements until the forward motion of the intermediate slide 20 is arrested by pin 40 engaging stop 41. The stamps 14 and 15 are now disposed about the base 2 ready for printing. Further forward motion of the carriage 21 moves the pin follower 38 from 39*d* to 39*c* and moves stamp 15 into contact with base 2 and transfers the characters of the stamp 15 upon the base 2 (Fig. 1*c*). Still further forward motion of the carriage 21 moves follower pin from 39*c* to 39*b* thus retracting stamp 15 and bringing stamp 14 into contact with the base 2 and transfers the characters of stamp 14 upon the base 2 (Fig. 1*d*). Then the carriage 21 continues to move longitudinally forward and to move the follower pin 38 from 39*b* to 39*a* and to move the stamps 14 and 15 into a neutral position ready to be carried backward to the position shown in Fig. 1 again to repeat the cycle of operation upon the next lamp base which has been indexed into the printing station.

Although the machine has been described in detail as to its component parts, it will be understood that such detail is for the purpose of illustration and not by way of limitation. The appended claims are therefore intended to cover any such modifications coming within the true scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A mechanism for marking characters on the cylindrical portions of articles periodically presented at a work station, comprising a support member, a pair of stamps fixedly mounted on said support member in opposed spaced relation, carriage means mounting said support member for advance movement toward said article to position said stamps on opposite sides of said article and for retraction from said advance position, said support means being movably mounted on said carriage means for linear movement transverse to the advance movement of said carriage means while the carriage is in the advanced position, and actuating means on said support member engaging with cooperating means on the carriage means to effect said transverse linear movement of said support member alternately in opposite directions to contact said stamps with opposite sides of said article and impress said characters on said article.

2. A mechanism for marking characters on the periphery of the cylindrical portions of articles periodically

presented at a work station, comprising a support member, a pair of stamps secured to said support member in opposed space relation, carriage means mounting said support member for advance movement toward said article to position the said stamps in an advanced position on opposite sides of said article and for withdrawal from said advance position to a retracted position, automatic inking means comprising an ink platen located so that said stamps are disposed on opposite sides of the ink platen when in said retracted position, said support means being movably mounted on said carriage means for movement transverse to the advancing and retracting movement of said carriage means, and actuating means on said support member engaging with cooperating means on the carriage means to effect the said transverse movement of said support member alternately in opposite directions while in the advance position in order to contact said stamps with oppsite sides of said article and impress said characters on said article and to also effect said transverse movement of the support member alternately in opposite directions while in the retracted position in order to contact said stamps with the ink platen.

3. A mechanism for marking characters on the periphery of the cylindrical bases of electric lamps periodically presented in fixed position at a work station, comprising a support member, a pair of stamps fixedly mounted on said support member in opposed spaced relation, two-part carriage means mounting said support member for advance movement toward said article to a forward position whereat the stamps are disposed on opposite sides of said article, means to arrest forward motion of a first part of said carriage means at said forward position, said support means being movably mounted on the first part of the carriage means for movement transverse to the advancing movement thereof, and actuating means on said support means engaging with cooperating means on the second part of the carriage means to effect said transverse movement of the support means alternately in opposite directions, upon arrest of the advance movement of said first part of the carriage means and continued advance movement of said second part of the carriage means, to contact said stamps with opposite sides of said article and impress said characters on said article.

4. A mechanism for marking characters on the periphery of the cylindrical bases of electric lamps periodically presented in fixed position at a work station, comprising a support member, an inking pad, a pair of stamps fixedly mounted on said support member in opposed spaced relation, two-part carriage means mounting said support member for advance movement toward said article to a forward position whereat the stamps are disposed on opposite sides of said article and for withdrawal from said advance position to a retracted position where the stamps are disposed on opposite sides of said inking pad ready to be inked, means to arrest the advance motion and the withdrawal motion of a first part of said carriage means

at the respective forward and retracted positions of said support member, said support member being movably mounted on the first part of the carriage means for movement transverse to the advancing and retracting movement thereof, and actuating means on said support means engaging with cooperating means on the second part of the carriage means to effect said transverse movement of the support member alternately in opposite directions, upon arrest of the advance movement of said first part of the carriage means and continued advance movement of said second part thereof, to contact said stamps with opposite sides of said article and to effect said transverse movement of the support member alternately in opposite directions, upon arrest of the retraction movement of said first part of the carriage means and continued retraction movement of said second part thereof, to contact said stamps with said inking pad.

5. An electric lamp base printing mechanism adapted to operate upon a lamp base at a station of a lamp basing machine of the indexing turret type comprising a cross-slide, a pair of stamps fixedly mounted on said cross-slide in opposed spaced relation, an intermediate slide carrying said cross-slide, a carriage member having a cam slot therein and carrying said intermediate slide for advance movement toward said lamp base to a forward position in which the said stamps are disposed on opposite sides of said lamp base and for withdrawal from said forward position to a retracted position, an inking pad about which said stamps are disposed when in said retracted position, means to arrest the advance motion and the withdrawal motion of said intermediate slide at the respective forward and retracted positions thereof, said cross-slide being mounted on said intermediate slide for movement transverse to the advancing and retracting movement thereof, a cam-follower pin mounted on said cross-slide and extending through said intermediate slide and engaging with the cam slot of said carriage, said cam slot being shaped to effect transverse movement of the cross-slide alternately in opposite directions, upon arrest of the advance movement of said intermediate slide and continued advance movement of the carriage and also upon arrest of the retraction movement of said intermediate slide and continued retraction of the carriage whereby, in the advanced position of said intermediate slide, said stamps are contacted with opposite sides of said lamp base to imprint the characters thereon and, in the retracted position of said intermediate slide, said stamps are contacted with said inking pad to pick up ink for the next printing operation.

References Cited in the file of this patent

UNITED STATES PATENTS

651,221	Weiss et al.	June 5, 1900
2,703,523	Childs	Mar. 8, 1955