Jan. 14, 1958 W. H. GLUNZ 2,819,669

APPARATUS FOR PRINTING ON MOVING ARTICLES

Filed May 18, 1956

Fig. 4.

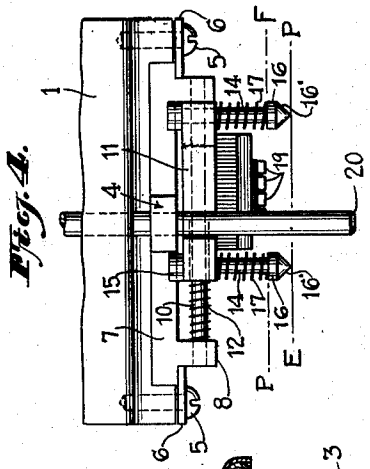


Fig. 5.

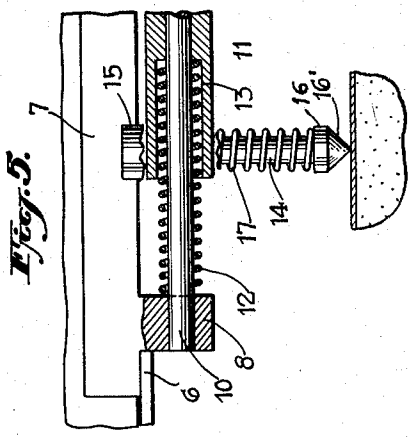


Fig. 1.

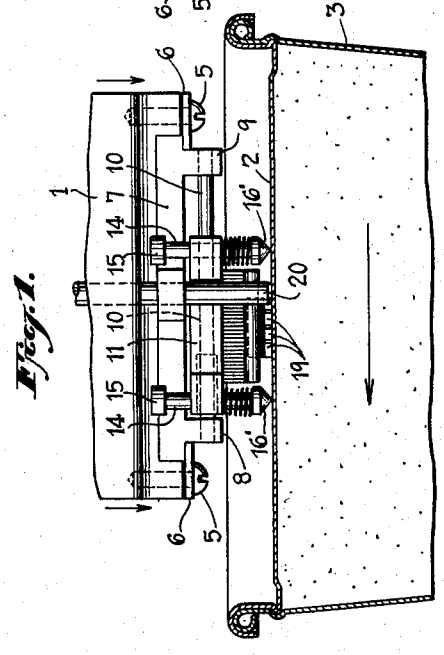


Fig. 2.

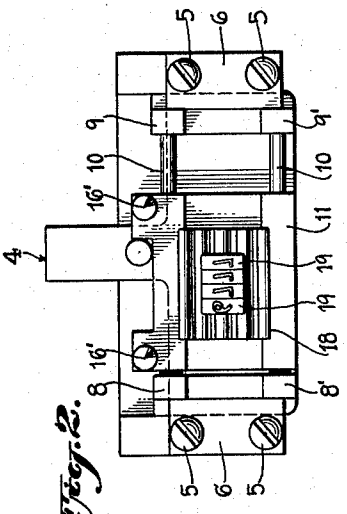
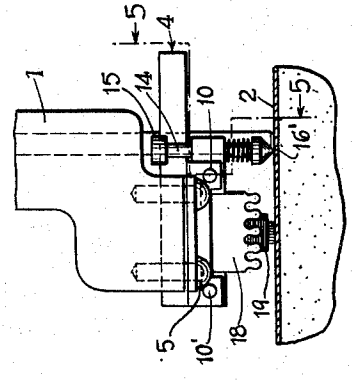


Fig. 3.



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2,819,669

APPARATUS FOR PRINTING ON MOVING ARTICLES

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Application May 18, 1956, Serial No. 585,872

5 Claims. (Cl. 101—35)

This invention relates to apparatus for printing on moving articles and more particularly for marking successive articles of a series of articles while in motion. The invention is especially useful for marking on the recessed covers of successive containers while they are being moved past a marking station, as by means of a line conveyor forming a part of filling and capping apparatus. This invention has been found particularly useful in the printing apparatus disclosed and claimed in the co-pending application of Harold Porter, Jr., and William H. Glunz, Serial No. 585,701, filed May 18, 1956, for Electrically Controlled Apparatus for Printing on Moving Articles.

Heretofore in marking or coding machines for containers of this type it has been customary to bring successive containers to rest at the marking station. This not only causes an appreciable time loss in the marking operation but delays the production line of the filling and capping stations past which the containers are fed, usually by continuous conveyor. For this reason there has been a long-felt want for suitable means which could be employed in conjunction with capping and filling machines for marking suitable indicia on the recessed covers while the containers were moving past the marking station.

While attempts have been made to accomplish this, such attempts heretofore have not been satisfactory, not only because of the severe timing and registration problems but especially in connection with the marking of containers on the upper face of their closure covers in an area which is recessed from the upper lip of the article and which surface to be printed upon is somewhat yieldable and not always in the same horizontal position. These conditions require a vertically reciprocable movement of the indicia type and a printing pressure during the printing engagement. Prior to this invention these conditions could not be satisfactorily met without bringing the articles to rest during the printing.

While the present invention is especially intended for the conditions above set forth, it will be obvious to those skilled in the art that it may be usefully employed in printing or marking various types of articles while in motion past the marking stage.

This invention contemplates a simple and dependable unit readily adaptable for use in coding machines and the like printing apparatus and providing means for clearly and sharply printing desired indicia on a continuously moving article.

According to this invention provision is made for holding the indicia type for positive reciprocal movement into engagement with and away from the face of the article to be printed while permitting the type and its holder to move with a continuously moving article during the period of printing engagement. The invention further provides means for positively holding the type in definite printing register with the article to be printed before and during the printing period.

The following is a description of a presently preferred

embodiment of the invention for marking on the closure covers of containers made of paper or the like during their continuous travel from a filling and capping machine, reference being made to the accompanying drawings, in which:

Fig. 1 is a front elevational view showing the printing unit of this invention mounted on a reciprocating head with the indicia type in printing engagement with a moving article to be printed;

Fig. 2 is a bottom view of the printing unit shown in Fig. 1, showing the printing face of the type;

Fig. 3 is a side elevational view of the device as shown in Fig. 1;

Fig. 4 is a view similar to Fig. 1 but showing the position of the parts just prior to printing engagement; and

Fig. 5 is a cross sectional segmental view on a somewhat enlarged scale, showing further details of certain parts of the device illustrated in the foregoing figures.

Referring more particularly to Figs. 1 and 3: A printing head designated **1** is provided with suitable means (not shown) for reciprocating it in a vertical direction toward and away from the surface to be printed upon, such as the recessed upper face of closure **2** of a container **3** moving in the direction of the arrow (Fig. 1). A printing unit designated generally as **4** is rigidly secured to the lower end of the reciprocable head **1** by inserting in gibs **6**, which are secured to head **1** by screws **5** and retained in this position by allowing finger **20** to pass through hole in frame **7**. This permits easy removal of printing unit **4** for cleaning and servicing.

The printing unit **4** comprises a frame **7** provided with a pair of downwardly extending lugs **8—8'**, disposed adjacent its front end and a corresponding pair of lugs **9—9'** disposed adjacent its rear end in spaced relation to the lugs **8—8'** in the direction of travel of the container **3**. A pair of laterally spaced guide rods **10—10'** are rigidly supported by the lugs **8—9** and **8'—9'** and extend parallel to the path of container travel. A carriage **11** is freely slidably mounted on the rods **10—10'** which pass through parallel bores in the carriage **11**. The rods **10—10'** are each surrounded by a helical compression spring such as **12** (Fig. 4) disposed between lugs **8—8'** and the adjacent end of carriage **11** serving to resiliently urge said carriage in the direction opposite the travel of container **3**. The carriage **11** is counterbored as at **13** (Fig. 5) for receiving the springs such as **12**, so as to permit full travel of the carriage **11** to the lugs **8—8'** which serve as limit stops in one direction while the lugs **9—9'** serve as limit stops in the other direction of carriage travel.

A pair of pins such as **14** are freely slidably mounted in a side edge of the carriage **11** for vertical movement relative thereto. The pins **14** are each provided with axially spaced heads such as **15** and **16** and their stems are surrounded by helical compression springs such as **17** yieldably urging the pins downwardly. The pins **14** are provided at their lowermost extremities with suitable means such as points **16'** for driving engagement with the article to be printed. The mounting of the pins is such that the engaging ends **16'** are urged to an extended position represented by line EP (Fig. 4) below the printing face of the indicia type located on the line PF and are movable upwardly to a retracted position substantially on the line PF (Figs. 1 and 3).

A type holding block **18** is secured to and carried by the carriage **11** and is provided with means for removably holding type elements such as **19**, which in the embodiment shown are numerals such as may constitute a code number, but may be letters, symbols, or any desired indicia to be printed, either in the form of ink printing or embossing printing.

While the pointed ends **16'** admirably serve as registra-

tion means for driving engagement with paper or the like material, it is contemplated that the engaging member may be varied as to form or material in accordance with the character of the article to be printed. Also, it will be readily understood that the slidable mounting of the type carriage on rods **10—10'** is a mechanically simple means of providing for movement of the type in a direction of the path of the article to be printed and relative to the printing head while holding the printing face of the type substantially parallel to the area to be printed. While this particular mounting is presently preferred it is within the contemplation of the invention that known mechanical equivalents may be employed to provide this required movement.

Operation

With the reciprocable head **1** in raised position and with a container being fed in the direction to the left (Fig. 4) a container is brought under the usual feeler finger **20** and when the finger **20** strikes the closure of a receptacle the printing stroke of the head **1** is permitted in the manner well known. At the beginning of the printing stroke the points **16'** of the register pins **14** engage the surface of the closure to be printed upon, e. g., when said surface reaches the line EP, and this engagement drives the carriage **11** against the yieldable springs **12** so that in advance of the printing engagement of the type **19** with the container the type is traveling at the same identical speed as the container and is maintained in printing register therewith during the full printing period, during which the points **16'** have been retracted to the position shown in Fig. 1. Before the carriage reached its full stroke the head **1** is so timed as to move away on its return or upward stroke.

While the invention has been described in particularity with reference to the preferred form thereof, it readily will be understood by those skilled in the art after understanding the invention that further modifications and changes may be made therein without departing from the spirit and scope of the invention, as defined by the claims appended hereto.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In a printing unit for printing on a linearly moving article, the combination of a frame adapted to be secured to a reciprocating printing head for movement of the unit in a direction normal to the moving article, a carriage for holding indicia type and slidably supported on said frame for longitudinal linear movement relative thereto parallel to the path of the moving article, resilient means urging said carriage in one direction of said longitudinal movement and yieldable to permit movement in the opposite direction, and registration means extending outwardly beyond the printing face of said type and yieldably supported for inward movement to substantially the plane of said printing face, whereby upon movement of said printing unit toward said article said registration means engages the surface of the article to be printed upon before it is engaged by the type and thereafter as said type comes into printing engagement with an article moving in opposition to said resilient means said type is permitted to move with said article through a period of printing engagement and at the end of said printing engagement said type is urged by said resilient means to its initial position on said frame.

2. In a printing unit for printing on a moving article, the combination of a frame adapted to be secured to a printing head for movement of the unit in a direction toward the moving article, a carriage for holding indicia type, means supporting said carriage from said frame for movement relative thereto in a direction parallel to the path of the moving article, resilient means urging said carriage in one direction of said parallel movement and yieldable to permit movement in the opposite direction, and registration means comprising a drive engaging portion yieldably held outwardly beyond the printing face of said type for advance registering engagement with the article to be printed and movable in a direction normal to said printing face to substantially the plane thereof, whereby upon movement of said printing unit toward said article said registration drive engaging portion engages the surface of the article to be printed upon before it is engaged by the type and thereafter as said type comes into printing engagement with an article moving in opposition to said resilient means said type is moved with said article through a period of printing engagement and at the end of said printing engagement said type is urged by said resilient means to its initial position on said frame.

3. In a printing unit for printing on a linearly moving article, the combination of a frame adapted to be secured to a reciprocating printing head for movement of the unit in a direction normal to the moving article, a carriage for holding indicia type and slidably supported on said frame for longitudinal linear movement relative thereto parallel to the path of the moving article, resilient means urging said carriage in one direction of said longitudinal movement and yieldable to permit movement in the opposite direction, and registration means comprising a pair of pins spaced apart in said longitudinal direction and slidably mounted on said carriage for movement in a direction normal to the printing face of said type, said pins having pointed outer ends and being provided with resilient means urging the pointed ends of said pins outwardly beyond said printing face for advance registering engagement with the article to be printed upon and yieldable to permit movement of said pointed ends inwardly as said type moves into printing engagement with said article, whereby upon movement of said printing unit toward said article said registration means engage the surface of the article to be printed upon before it is engaged by the type and thereafter as said type comes into printing engagement with an article moving in opposition to said carriage resilient means said type is permitted to move with said article through a period of printing engagement and at the end of said printing engagement said type is urged by said carriage resilient means to its initial position on said frame.

4. In a printing unit for printing on a linearly moving article, the combination of a frame adapted to be secured to a reciprocating printing head for movement of the unit in a direction normal to the longitudinally moving article, said frame having a pair of laterally spaced parallel guide rods extending parallel to the path of movement of said article, a carriage holding indicia type and slidably supported on said guide rods for longitudinal linear movement thereon and helical springs surrounding said rods and disposed between said carriage and frame and yieldably urging said carriage in one direction of said longitudinal movement while permitting movement in the opposite direction, whereby upon movement of said printing unit into printing engagement with an article moving in a direction in opposition to said springs said type is permitted to move with said article through a period of printing engagement and at the end of said printing engagement said type is urged by said springs to its initial position on said frame.

5. In apparatus for printing on a longitudinally moving article comprising a printing head reciprocable in a direction normal to the path of the moving article, the combination with said printing head of a printing unit comprising a frame secured to said head for movement therewith, said frame having a pair of laterally spaced parallel guide rods extending parallel to the path of movement of said article, a carriage holding indicia type and slidably supported on said guide rods for longitudinal linear movement thereon and helical springs surrounding said rods and disposed between said carriage and frame and yieldably urging said carriage in one direction of said longitudinal movement while permitting movement

in the opposite direction, whereby upon movement of said printing unit into printing engagement with an article moving in a direction in opposition to said springs said type is permitted to move with said article through a period of printing engagement and at the end of said printing engagement said type is urged by said springs to its initial position on said frame.

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