April 15, 1952 I. S. GOTTSCHO ET AL 2,592,558

MARKING DEVICE

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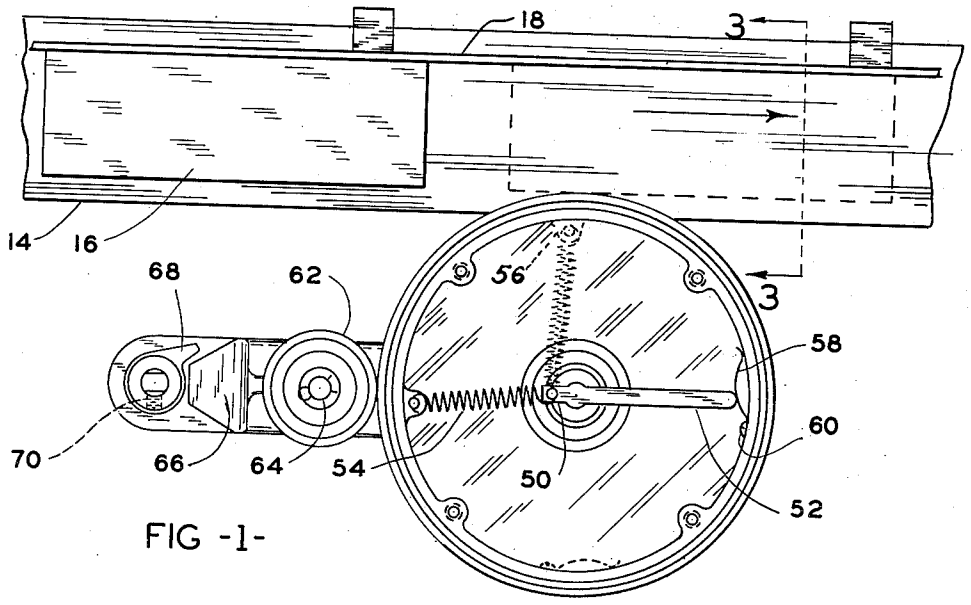


FIG -1-

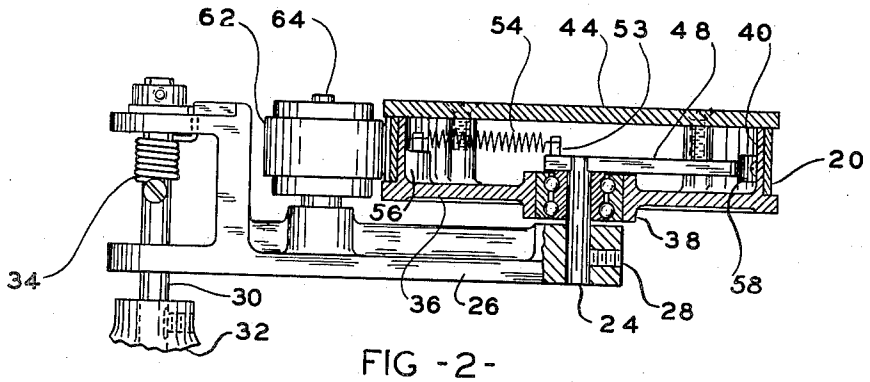


FIG -2-

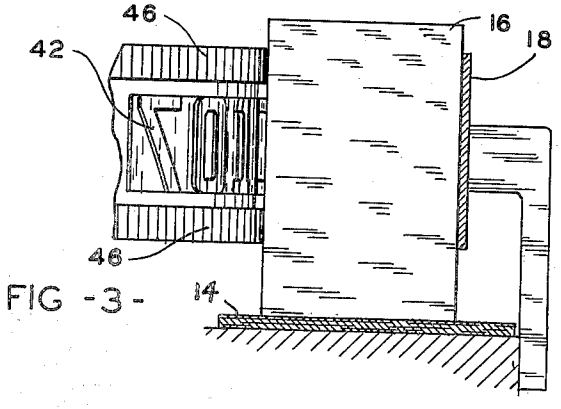


FIG -3-

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UNITED STATES PATENT OFFICE

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MARKING DEVICE

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8 Claims. (Cl. 101—37)

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This invention relates to improvements in marking devices and is particularly directed to devices for applying indicia to continuously or intermittently moving articles.

The present invention is particularly well adapted for marking packages and the like carried by a continuously moving conveyor and will be described in connection with such use. However, it is to be understood that the devices of this invention may be employed in the marking of any moving object.

In marking devices of the character indicated, as heretofore made, a rotary printing or imprinting drum is employed having type or indicia on the periphery thereof which contacts an inking roller to transfer ink thereto. The drum is rotated through the frictional contact of the moving article with the drum, whereby the impression of the inked type or indicia is applied to the article, and, as the article moves out of contact with the drum, the drum is returned to normal position by spring means. In such structures, a rigid stop is provided for limiting the return movement of the drum so that when the drum or a projection thereon engages the stop a shock is imparted to the device. Such shock, besides causing the device to wear more rapidly, imparts vibration or oscillation to the drum resulting in a blurred impression on the article at the commencement of the next cycle of operation. Moreover, in such structures the stop also limits the rotation of the drum in its indicia applying direction, so that, in the event an article is being marked which has a greater length than the circumference of the drum, the drum ceases rotating before the article has disengaged the drum resulting in a rubbing of the moving article on the stationary drum with resulting blurring of the indicia.

Accordingly, one of the objects of the present invention resides in the provision of a marking device which overcomes all of the aforesaid disadvantages and inefficiencies of prior devices of this character.

Another object resides in the provision of a resilient brake or stop for limiting the return movement of the printing or impression drum after one cycle of operation, and which will accurately position the drum for the next cycle.

Another object resides in the provision of a device of the character indicated which is capable of making a fraction of a complete revolution, a complete revolution or any number of revolutions, and, after each of any such operations, will be returned to its proper position for the following cycle of operation.

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Another object resides in the provision of brake or stop means for the printing drum which is resilient and thereby prevents shock to the device upon stopping the rotation of the drum, which will yield to permit one or more revolutions of the drum, and which will always return the drum to its initial position ready for succeeding cycles of operation.

A further object resides in the provision of such brake or stop means which will arrest movement of the drum upon its return to its initial position and will eliminate vibration or oscillation thereof.

A still further object resides in the provision of mounting means for the device whereby contact of the printing drum with the articles to be marked is always assured.

Other and further objects of this invention will be manifest from the following description and the accompanying drawing, wherein:

Fig. 1 is a plan view of the device with the cover plate of the printing or impression drum removed to expose the interior mechanism;

Fig. 2 is a vertical sectional view of the drum, the supporting structure for the drum being shown in elevation; and

Fig. 3 is a view taken on line 3—3 of Fig. 1.

Referring to the drawing in detail, there is shown a conveyor mechanism which includes a conventional conveyor 14 on which articles 16 to be marked are conveyed to the marking device. A vertically extending back board or wall 18 may be provided adjacent the conveyor to prevent lateral movement of the articles on the conveyor during the marking operation. It is to be understood that any other conventional means may be employed to prevent lateral movement of the articles, such as upper and lower belts or the like.

A printing drum 20 is rotatably mounted by means of a ball bearing assembly on a vertical stub shaft 24 which is supported on one end of a bracket 26 and is secured thereto by a set screw 28. The other end of the bracket is provided on a shaft 30 supported by a structural element 32 which may be part of the conveyor mechanism, and a spring 34 is associated with the bracket and the shaft 30 for urging the bracket in a direction to position the drum for frictional engagement by the articles 16 being moved by the conveyor.

The drum 20 is hollow and comprises a base plate 36 formed with a hub 38 in which the outer race of the ball bearing assembly is positioned, a cylindrical side wall 40 on which is mounted a resilient cushion or rubber strip 42 having

thereon type or indicia, and a cover plate **44** removably secured to the wall **40** by screws or the like. Preferably, the outer periphery of the cover and base plate are of diameters slightly smaller than that of the raised portions of the type or indicia, whereby the peripheries are frictionally engaged by the articles to effect rotation of the drum, and frictional engagement by the type or indicia to rotate the drum is not relied upon, thus eliminating blurring of the impression applied to the articles due to slippage, between the type or indicia and the articles. To further facilitate such frictional engagement of the articles, the outer periphery of the cover and base plate may be milled or knurled as indicated in Fig. 3 by the reference numeral **46**.

Located within the drum **20** is a stationary bar **48** which is mounted on the upper end of the stub shaft **24** and is keyed thereto. The bar extends diametrically with respect to the drum and radially with respect to the stub shaft and has a short arm **50** and a long arm **52**, the purpose of which is about to be described.

The short arm has an upwardly extending pin **53** to which one end of a spring **54** is attached, and the other end of the spring is attached to a lug **56** at the interior of the side wall of the drum. This spring serves to return the drum to a predetermined initial position, as shown in full lines in Fig. 1, upon being released by the article in frictional contact therewith after having been rotated by such article any number of revolutions or a fraction of a revolution.

In order to arrest movement of the drum upon being returned to its initial position, brake or stop means are provided, which by way of example may comprise an arcuate spring clip **58** having one end secured on the inside of the side wall of the drum by a screw **60**, and having its other end bent inwardly of the wall. The arcuate portion of the clip is in the path of the free end of the long arm **52** of the bar, whereby to be engaged by that end of the bar. This spring clip provides a resilient brake for the drum and, as just mentioned, is positioned relative to the long arm **52** of the bar so that the drum will be properly positioned for the beginning of the next cycle of operation, as will be more fully understood from the description of the operation of the device about to follow.

A circular inking pad **62** provided with an internal ink supply source (not shown) is rotatably mounted on the bracket **26** by a shaft **64** in rolling contact with the type or indicia strip on the drum, whereby rotation of the drum effects inking of the strip thereon.

In order to position the bracket so that the periphery of the drum is engaged by the article without obstructing the passage of the article **16** on the conveyor **14**, a stop **66** is formed on the bracket which is adapted to be engaged by a finger **68** secured to the upper end of the shaft **30** whereby movement of the bracket and the drum thereon in a direction across the conveyor is limited. If desired, the finger **68** may be adjustably secured to the shaft by a set screw **70**.

In operation, with the marking device and the article **16** in the full line position as shown in Fig. 1, the drum is in its initial position, and is retained in this position by the spring **54** and the clip **58** in engagement with the end of the arm **52**.

As the article is moved on the conveyor towards the position indicated in broken lines, the side wall of the article facing the drum engages the same to swing the drum and its supporting bracket **26** slightly outwardly from the conveyor so that the spring **34** is tensioned slightly and causes the drum to urge the article against the back board **18**. When the resilient type or indicia strip is engaged by the article, it is slightly compressed, thereby permitting the article to frictionally engage the knurled or milled periphery of the cover and base plates to effect rotation of the drum and the transfer of the impression to the article during its movement on the conveyor.

Rotation of the drum is continued as long as the side of the article remains in contact therewith. As shown in broken lines in Fig. 1, the drum has been rotated about ninety degrees just prior to the article having moved past the drum, the extent of rotation, or number of rotations, being determined by the length of the article. In the event the drum is rotated more than one complete revolution, the clip **58** yields and rides over the end of the arm **52**. The drum return spring **54** is now tensioned sufficiently to rotate the drum to its initial position, in this case in a reverse direction, the instant the package or article has been moved out of frictional engagement with the drum.

As the latter occurs, the spring **54** returns the drum, as previously mentioned, to the position shown in full lines, whereupon the spring clip **58** engages the end of the long arm **52** of the stationary bar and acts as a resilient stop or brake to retain the drum in such position and dampens any vibration or oscillation reaction caused by the inertia of the drum acting on the spring. In this manner, the drum is instantaneously retained in stationary position ready for engagement by the succeeding article which may be spaced very closely behind the article just marked.

In the event the article to be marked is longer than the circumference of the drum or of a length equal to several times the circumference of the drum, the drum will be caused to make more than one revolution while the article is in frictional engagement therewith. In such event the spring **54** will make an equal number of revolutions about the pin **53**, but as soon as the article disengages the drum the spring will be under tension, unless the article disengages the drum while the latter is in its initial position, and the spring will effect the return of the drum to its normal position, where the rotation of the drum will be arrested by the brake or clip **58**.

By reason of one end of the clip **58** being free, the bar **52** will depress the clip as the clip passes the end of the bar during each of the several revolutions of the drum in the event the article being marked is longer than the circumference of the drum. However, when the article disengages the drum the driving friction is released and the clip will be engaged by the bar to effect arresting of the rotation of the drum in the manner previously described.

In the event the length of the article being marked is less than the circumference of the drum, the drum will be released from the frictional engagement of the article and will return to its normal position under the action of the spring before it makes a complete revolution.

In view of the foregoing description, it will be seen that the present invention provides an improved marking device of the character indi-

cated which is simple and economical in construction, and reliable in operation. The device can withstand long and continued usage without requiring maintenance or repair.

While we have illustrated and described a preferred embodiment of our invention it is to be understood that we do not wish to be limited to the precise structure and arrangement of parts as illustrated and described, as obviously various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What we claim is:

1. In a marking device of the class described, a stationary shaft, a hollow substantially cylindrical drum having marking means on its periphery and being rotatably mounted on said shaft, a radially extending member secured to said shaft within said drum having one end adjacent the inner wall of said drum, a spring connected to said member and said drum for returning said drum to a predetermined position, and a spring clip on the inner wall of said drum for engaging said end of said member to retain said drum in such position.

2. In a marking device of the class described, a stationary shaft, a hollow substantially cylindrical drum having marking means on its periphery rotatably mounted on said shaft, a member fixed on said shaft within said drum having a short radial arm and a long radial arm provided with a free end adjacent the inner wall of said drum, a spring connected to said short arm and the inner wall of said drum for returning said drum to a predetermined position, and a spring clip on the inner wall of said drum for engaging said free end of said long arm to retain said drum in such position.

3. In a marking device of the class described, a stationary shaft, a hollow substantialy cylindrical drum having marking means on its periphery rotatably mounted on said shaft, a member fixed on said shaft within said drum having a short radial arm and a long radial arm provided with a free end adjacent the inner wall of said drum, a spring connected to said short arm and the inner wall of said drum for returning said drum to a predetermined position, and an arcuate spring clip having one end secured to the inner wall of said drum and its other end free and its arcuate portions disposed to move with the drum into the path of said free end of said long arm for engagement thereby to retain said drum in such position.

4. In a marking device of the class described, a stationary shaft, a hollow substantially cylindrical drum having marking means on its periphery rotatably mounted on said shaft, a member fixed on said shaft within said drum having a short radial arm provided with a pin thereon and a long radial arm provided with a free end adjacent the inner wall of said drum, a spring having one end pivotally connected to said pin on said short arm and having its other end connected to the inner wall of said drum for returning said drum to a predetermined position, and a spring clip on the inner wall of said drum for engaging said free end of said long arm to retain said drum in such position.

5. In a marking device of the class described, a stationary shaft, a drum rotatably mounted on said shaft and having marking means on the periphery thereof, circumferentially extending means adjacent said marking means having a roughened surface to facilitate frictional engagement thereof by an article to be marked for effecting rotation of said drum to cause said marking means to transfer an impression on the article, means conditioned upon rotation of the drum by the article for returning the drum to its initial position upon disengagement of the drum by the article, an arcuate spring clip having one end anchored to the inner wall of the drum and its other end free, and a member fixed on said shaft and projecting into the path of the arcuate portion of said clip, said clip yielding when engaged by said member during the rotation of the drum by an article being marked and cooperating with said member to arrest the rotation of the drum upon its return to its initial position after being disengaged by an article.

6. In a marking device of the class described, a stationary shaft, a substantially cylindrical drum having marking means on its periphery and being rotatably mounted on said shaft, a radially extending member fixed on said shaft and terminating at one end adjacent the cylindrical wall of said drum, a spring connected to said member and said drum for returning the latter to a predetermined position, and a spring clip on the cylindrical wall of said drum for engaging said end of said member to retain said drum in such position.

7. In a marking device of the class described, a stationary shaft, a substantially cylindrical drum having marking means on its periphery and being rotatably mounted on said shaft, a member fixed on said shaft having a short radial arm and a long radial arm provided with a free end adjacent the cylindrical wall of said drum, a spring connected to said short arm and to said drum at a point on the latter spaced radially from said short arm for returning said drum to a predetermined position, and yieldable means on said drum at the cylindrical wall of the latter for engaging said free end of said long arm to retain said drum in such position.

8. In a marking device of the class described, a stationary shaft, a substantially cylindrical drum having marking means on its periphery and being rotatably mounted on said shaft, a member fixed on said shaft having a short radial arm and a long radial arm provided with a free end adjacent the cylindrical wall of said drum, a spring connected to said short arm and to said drum at a point on the latter spaced radially outward from said short arm for returning said drum to a predetermined position, and a spring clip having one end secured to said cylindrical wall of the drum and being longitudinally bowed toward said shaft, the bowed portion of said clip moving with said drum in a path of travel into which said free end of said long arm projects for engagement by the latter to retain said drum in such predetermined position.

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