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Marozzi et al.

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[54] **INK CARTRIDGE WITH SEALING MEANS FOR RECIPROCAL PRINTING HEADS**

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[73] Assignee: **Bell-Mark Corporation,** Bloomfield, N.J. ; by said Fuzia, a part interest

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[52] **U.S. Cl.** **101/333,** 101/104, 101/334, 101/335, 101/366

[51] **Int. Cl.** **B41k 1/42**

[58] **Field of Search** 101/333, 334, 103, 104, 101/310, 316, 83, 97, 98, 101, 108, 291, 301, 324, 327, 335, 366, 310; 401/199, 101, 191, 193

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[57] **ABSTRACT**

An ink supply for a film marking apparatus from which a fast drying ink is obtained for prolonged periods of time without recharging. Recharging is accomplished by replacement of an ink storage container having a foam-like filler spaced from a closed end and exposed to a marking device at an open end through a porous pad and a restricted opening in a porous closure disk.

9 Claims, 5 Drawing Figures

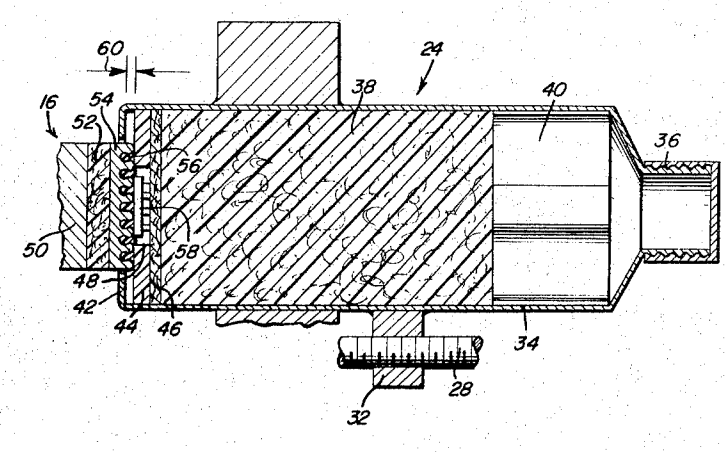


Fig. 1

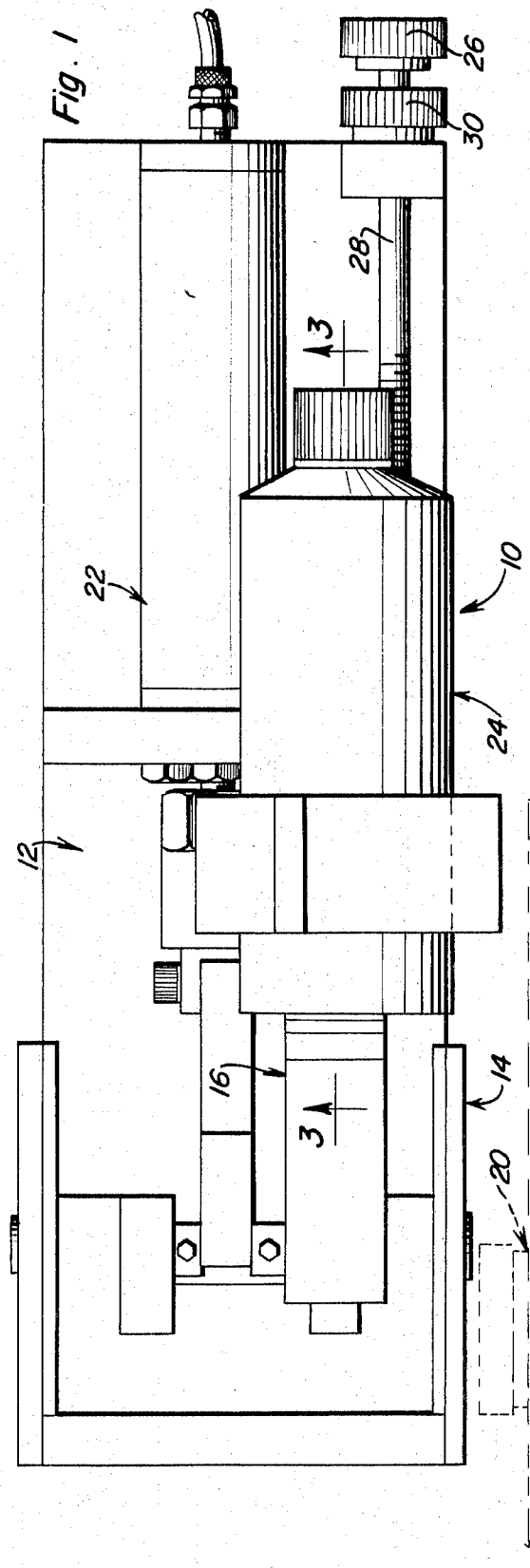


Fig. 2

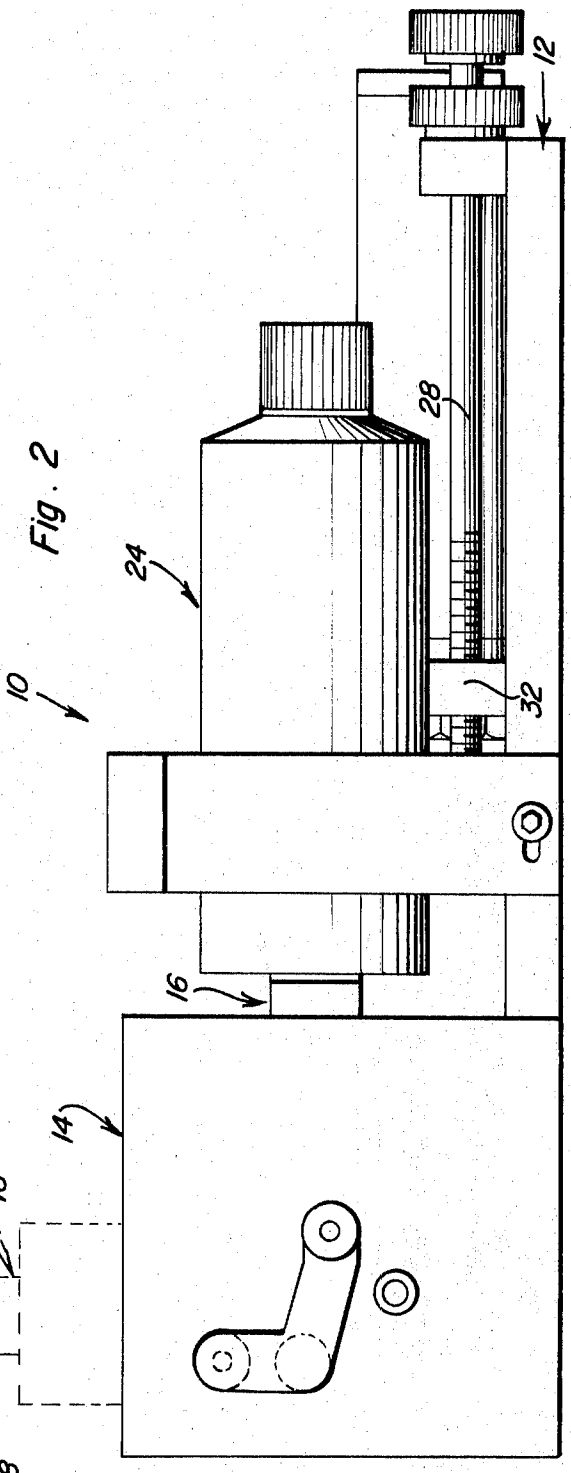


Fig. 4

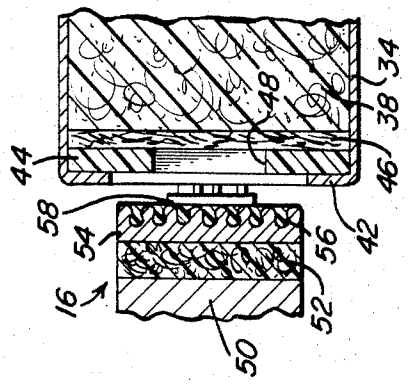


Fig. 3

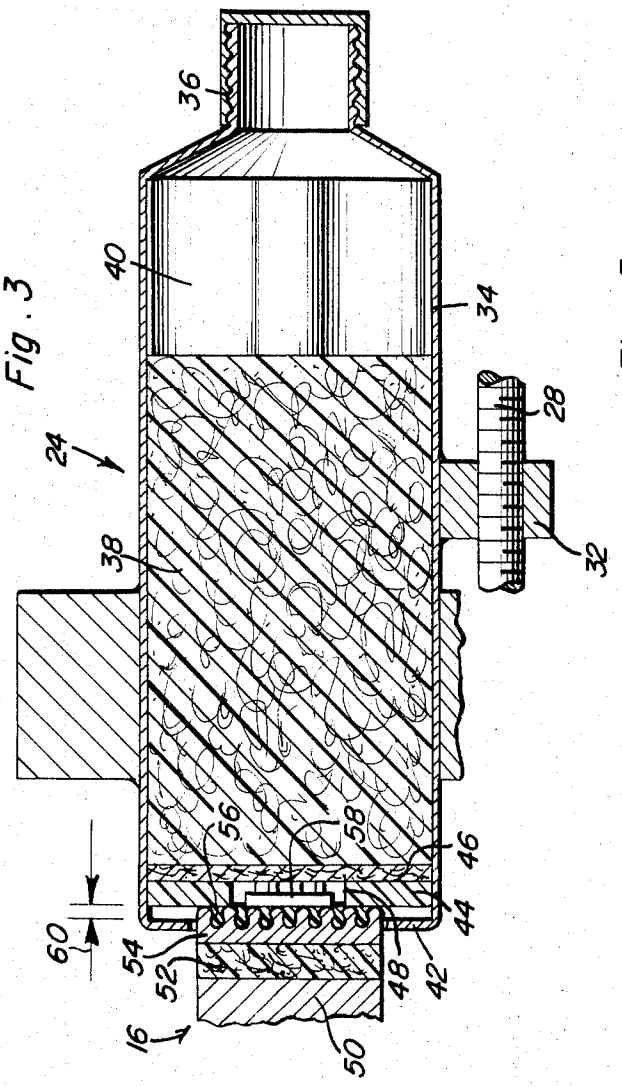
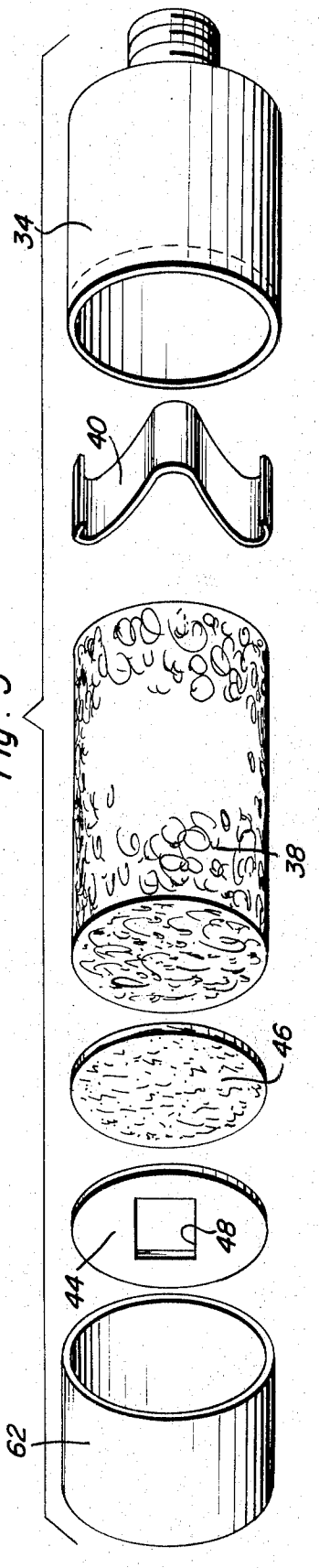


Fig. 5



INK CARTRIDGE WITH SEALING MEANS FOR RECIPROCAL PRINTING HEADS

This invention relates to inking systems for marking moving surfaces on packaging material or the like such as plastic film and is related to a prior copending application Ser. No. 45,785, filed June 12, 1970 now U.S. Pat. No. 3,662,682.

As indicated in my prior copending application, the use of a fast drying ink in automatic marking systems for imprinting moving surfaces, poses a problem because of the exposure of the ink in the ink supply reservoir to atmosphere resulting in the rapid drying of the ink supply and requiring frequent recharging thereof. In my prior copending application aforementioned, this problem was solved by the substantial sealing of the ink supply in conjunction with its continuous engagement with an ink transfer roller through which the ink is applied to a printing roller. A similar problem exists for the ink supply associated with a reciprocal action type of marking or printing device, to which the present invention is addressed.

In accordance with the present invention, an elongated ink storing cartridge is adjustably positioned for intermittently interrupted engagement by a printing head that is displaced between an ink receiving and a marking position. The ink storing cartridge includes a container made of a non-porous, air-impermeable material and houses an absorbent filler through which ink is transmitted by capillary action to a felt pad exposed through an opening in a non-porous closure element to the printing head. Thus, a controlled quantity of ink is transferred to the printing head when engaged while at the same time, the ink stored within the container is substantially sealed against drying by the air. The ink storing cartridge may be easily removed for replacement purposes and recharged by removal of a threaded cap at the closed end of the container. The open end may also be capped when the recharged storage cartridge is not in use.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a top plan view showing the installation for the present invention.

FIG. 2 is a side elevational view of the apparatus shown in FIG. 1.

FIG. 3 is a partial side sectional view taken substantially through a plane indicated by section line 3—3 in FIG. 1.

FIG. 4 is a partial sectional view showing withdrawal of the printing head from the ink storage device.

FIG. 5 is a perspective view of the disassembled parts associated with the ink storage device.

Referring now to the drawings in detail, FIGS. 1 and 2 illustrate a typical marking apparatus generally referred to by reference numeral 10 which includes a frame assembly 12 mounting a positioning mechanism 14 for a printing head 16 adapted to be displaced between an ink receiving position as shown by solid lines in FIGS. 1 and 2 and a marking position as shown by dotted line in FIG. 2. In the marking position, the printing head engages film 18 backed by a platen 20 for imprinting data on the film while its motion is momentarily interrupted. The printing head is intermittently displaced from its ink receiving position and returned to the ink receiving position by means of an air cylinder device 22 mounted on the frame assembly 12, and operatively connected to the positioning mechanism 14. The details of the positioning mechanism and cylinder device are known and form no part of the present invention.

An ink storage device generally referred to by reference numeral 24 is mounted in operative position on the frame assembly for engagement with the printing head 16 in its ink receiving position. The axial position of the ink storage device is adjusted by means of the adjustment knob 26 and the positioning screw 28. A lock nut 30 is tightened in order to hold the positioning screw in an adjusted position, the positioning screw being threaded through a positioning nut 32 for axial movement of the storage device to its adjusted position.

Referring now to FIGS. 3 and 5, the ink storage device 24 comprises an axially elongated container 34 made of a non-porous, air-impermeable material and closed at one axial end by a removable threaded cap 36. An over-size foam filler 38 is received within the container and is spaced from the closed end by a baffle spacing element 40 to form a reservoir chamber for ink. The container 34 has an open end through which the baffle element 40 and filler 38 are inserted, the open end having a radial flange 42 constituting means for limiting axial displacement of a non-porous, plastic closure disk 44 which is spaced from the adjacent end of the filler 38 by a porous felt disk 46. The closure disk 44 is provided with an opening 48 and is adapted to be contacted by the printing head 16 projecting through the open end of the container 34.

The printing head 16 includes a support block 50 to which a foam rubber type spacer 52 is cemented having a suitable pliable consistency. The spacer 52 supports a relatively rigid base lock mat 54 having a plurality of grooves within which a cement glue material 56 is received in a fluent state to become a rubber-like and pliable solid when set and forms a planar surface as shown in FIGS. 4 and 5 on which type face 58 is mounted. The restricted opening 48 in the closure disk 44 is dimensioned to receive the type face 58 therethrough as shown in FIG. 3 yet smaller than the planar surface adapted to contact the disk 44.

In the ink receiving position of the printing head 16 as shown in FIG. 3, the planar surface of the printing head engaging the closure disk 44, seals the fast drying ink contained within the absorbent filler 38 so as to prevent exposure to the atmosphere and drying thereof. At the same time, the type face 38 makes contact with the felt pad 46 saturated by the ink. Upon developement of a signal impulse in a manner well known by those skilled in the art, the air cylinder 22 is operative through the positioning mechanism to momentarily displace the printing head 16 from its ink-receiving position toward the marking position. The filler 38 being compressed by an amount indicated by reference numeral 60 in FIG. 3, is released and displaces the felt pad and closure disk to the limit position engaging the flange 42 as shown in FIG. 4. It will therefore be apparent, that a pumping action is involved as the printing head is displaced between its ink receiving and marking positions to cause flow of ink through the filler to the pad 46 in order to ensure that the ink picked off by the type is replaced, with a minimum

amount of exposure of the ink to atmosphere. The pressure exerted on the filler **38** for this purpose may be adjusted by means of the adjustment knob **26** as aforementioned.

The ink storage cartridge **24** may be removed and recharged when depleted of its supply of ink. For recharging, the end cap **36** is removed and approximately two and one-half ounces of a fast drying ink poured into the reservoir spaced occupied by the spacer element **40.** The ink is immediately absorbed by the foam filleand through capillary action saturates the felt spacer **46.** When recharged, the ink storing cartridge **24** may be stored for future use by placing a front cap **62** over the open end. The cartridge will thus remain airtight and retain the ink fresh for an indefinite period of time.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. In combination with a movable marking device having a planar sealing surface, an ink absorbent body, a body of liquid ink in contact therewith, a common container for the absorbent body and the ink having an opening into which the marking device is projected, displaceable closure means mounted within the container for intermittant compression of the absorbent body in response to displacement of the marking device, said closure means having an opening closed by the planar sealing surface of the marking device when projected into the container, and an inking pad spacing the absorbent body from the closure means transmitting ink from the absorbent body through the opening in the closure means during displacement thereof.

2. An ink storage means for a movable marking device comprising an elongated, non-porous container having a closed end and an open end, an absorbent body of material in said container, means spacing the body of absorbent material from the closed end to form a reservoir chamber for ink and sealing means within the container displaceable by the moveable marking device and engageable with the absorbent material at said open end of the container for inducing flow of ink from the absorbent body and substantially sealing the ink in the container while in contact with the marking device to prevent rapid drying of the ink.

3. The combination of claim **2** wherein the displaceable sealing means includes a non-porous closure element at the open end of the container having an opening closed by the marking device while in contact therewith, and a porous pad spacing the body of absorbent material from the closure element.

4. The combination of claim **3** wherein the container includes means for limiting axial displacement of the sealing means at the open end.

5. The combination of claim **3** wherein the marking device includes a planar surface displaceable between marking and ink-receiving positions, said planar surface engaging the closure element in the ink-receiving position to axially compress the body of absorbent material within the container.

6. The combination of claim **5** wherein the marking device further includes type projecting from the planar surface through the opening in the closure element into contact with the porous pad in the ink-receiving position of the marking device.

7. The combination of claim **6** wherein the container includes means for limiting axial displacement of the closure element at the open end.

8. The combination of claim **2** wherein the marking device includes a planar surface displaceable between marking and ink-receiving positions, said planar surface engaging the sealing means in the ink-receiving position to axially compress the body of absorbent material within the container.

9. The combination of claim **8** wherein the container includes means for limiting axial displacement of the sealing means at the open end.

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