July 29, 1969 A. A. MAROZZI 3,457,854

INK RESERVOIR DEVICE FOR PRINTING WHEELS

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Fig. 1

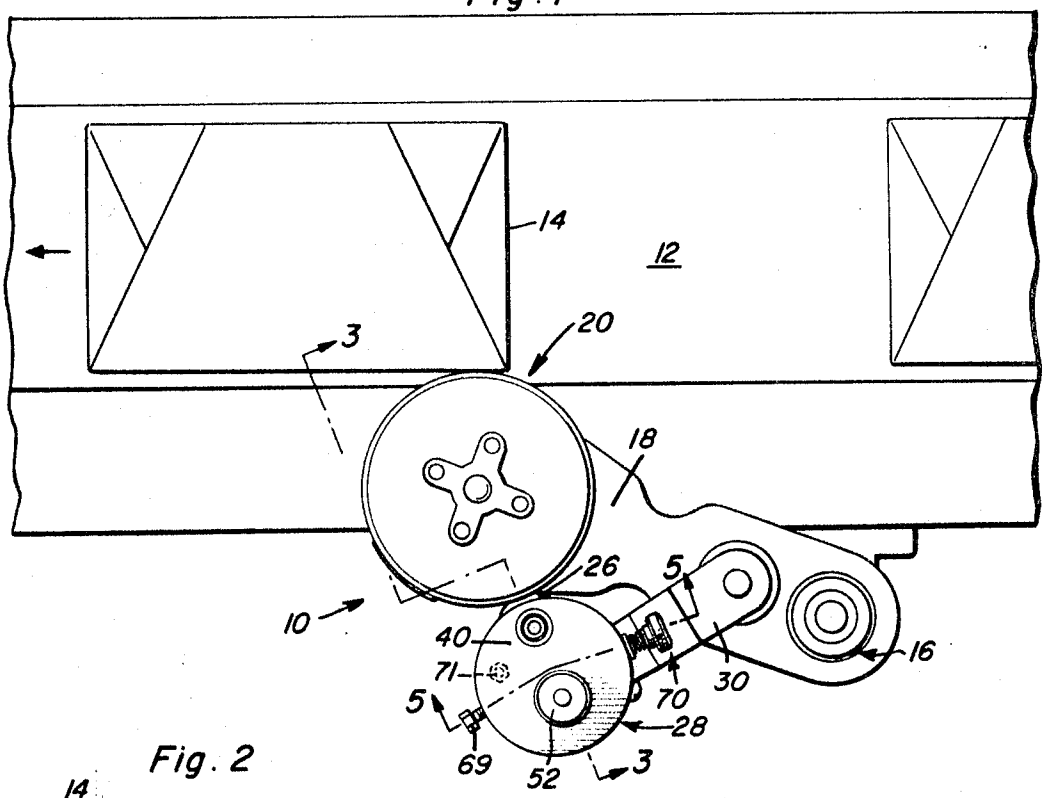


Fig. 2

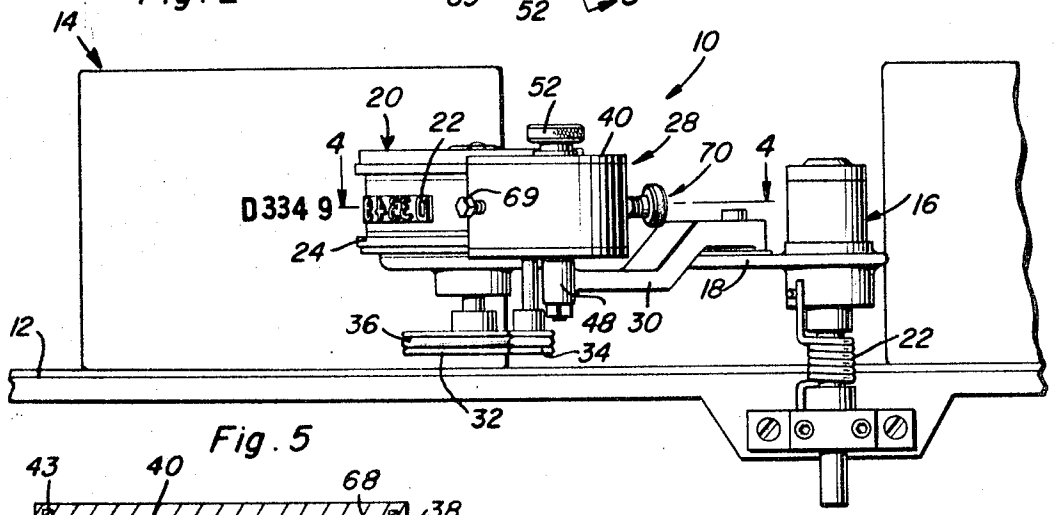
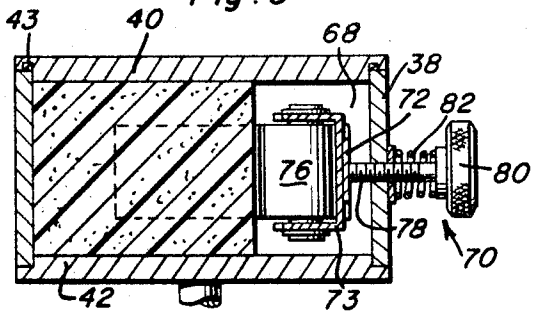


Fig. 5



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Fig. 3

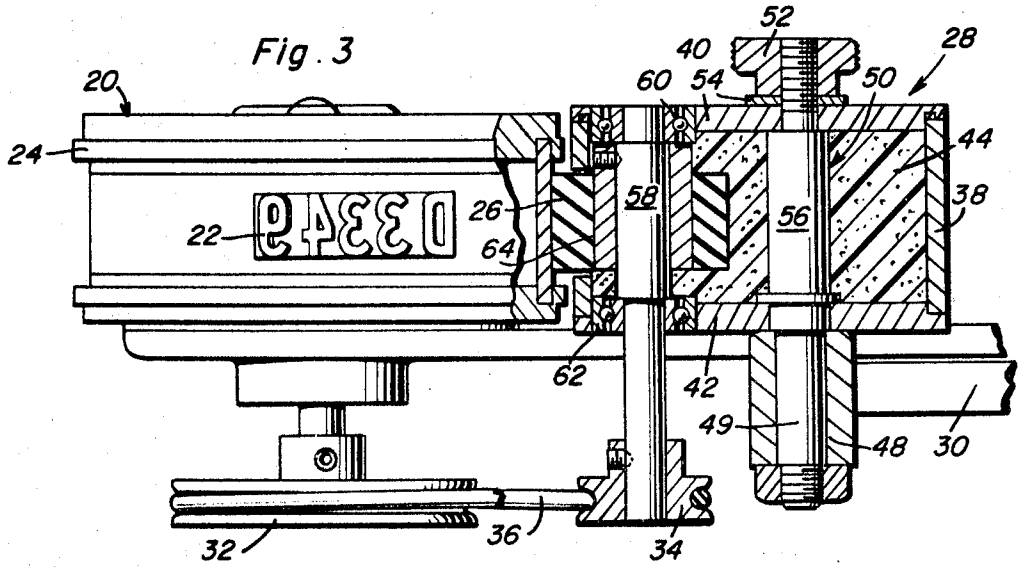
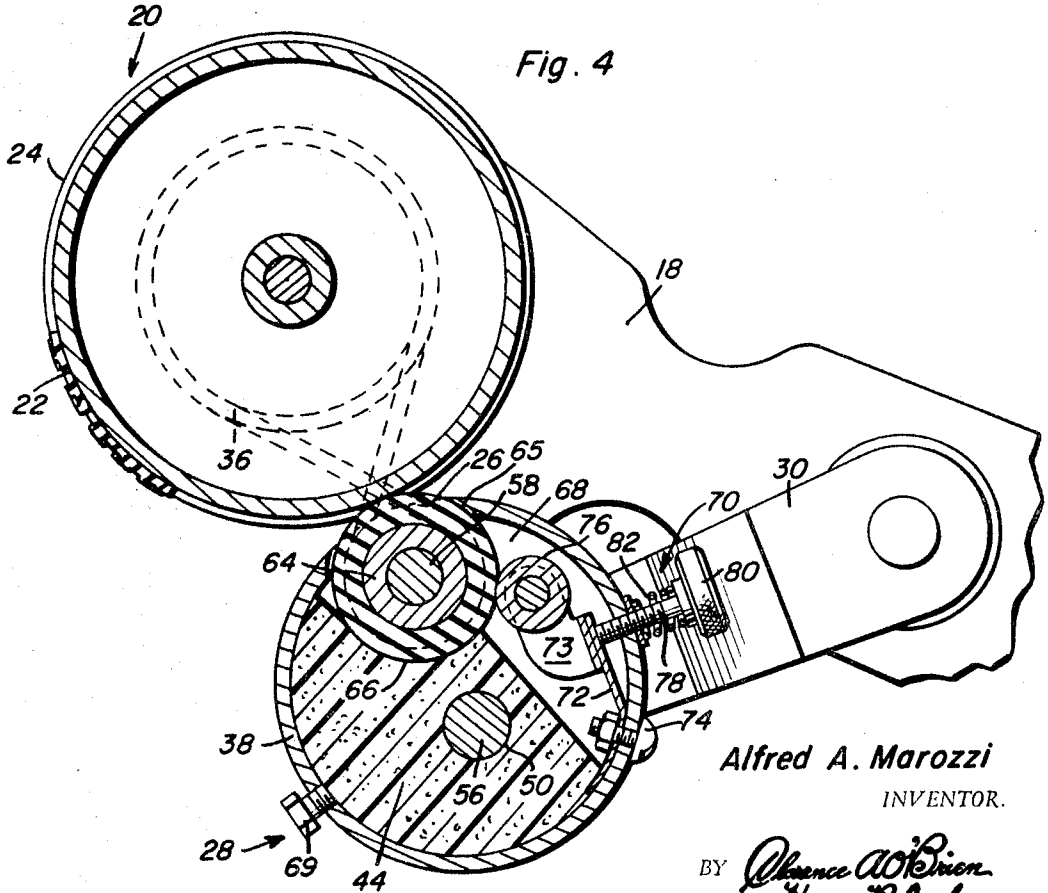


Fig. 4



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INK RESERVOIR DEVICE FOR PRINTING WHEELS

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U.S. Cl. 101—35 5 Claims

ABSTRACT OF THE DISCLOSURE

A printing wheel carried by a mounting arm urged into engagement with continuously moving articles or material for marking the same, the printing wheel being drivingly engaged with a transfer roller through which the type on the printing wheel is coated with ink. The transfer roller projects with a close fit from an ink reservoir housing from which an adjustably regulated supply of ink is obtained.

BACKGROUND OF THE INVENTION

This invention relates to the marking of articles or sheets of material being continuously conveyed by a printing or marking wheel device and more particularly to the adjustably regulated supply of ink to such marking wheel device.

Marking devices having associated facilities for feeding ink thereto are well known and usually involve a transfer roller in contact with the printing wheel for coating the type thereon with ink withdrawn from a reservoir by the transfer roller. The reservoir housing in most cases, contains a liquid body of ink within which the transfer roller is partially immersed. Ink absorbing pads for storing ink have also been utilized to avoid leakage. In the latter cases however, a slow drying type of ink is utilized in view of the drying affect of air. Further, it has been rather difficult to accurately adjust or regulate the quantity of ink transferred from the reservoir chamber to the printing wheel in order to suit different requirements. The present invention is accordingly addressed to the foregoing problems.

SUMMARY OF THE INVENTION

In accordance with the present invention, an ink reservoir is operatively positioned on the mounting arm for a rotatably mounted printing wheel rollingly engaged with a transfer roller projecting from the reservoir. The ink reservoir device is so arranged as to fixedly position within the ink reservoir chamber, a body of absorbent material within which a relatively rapid drying ink may be stored with a minimum amount of evaporation. The ink transfer roller is accordingly mounted by the reservoir housing for rotation in firm contact with the ink absorbent body and projects with a close fit from an opening in a leakage-free reservoir housing for rolling contact with the type on a printing wheel. An adjustably tensioned device within the reservoir chamber rotatably mounts a wiping roller in contact with the transfer roller for limiting the quantity of ink removed by the transfer roller from the ink absorbent body.

It is therefore a primary object of the present invention to provide an improved type of leakage-free ink reservoir device for marking wheels with a rapid drying ink through which the quantity of ink fed to the marking wheel may be adjustably regulated in order to suit different requirements.

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.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view showing a typical installation for a marking device embodying the adjustable ink reservoir device of the present invention.

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

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

FIG. 4 is an enlarged partial sectional view taken substantially through a plane indicated by section line 4—4 in FIG. 2.

FIG. 5 is an enlarged partial sectional view taken substantially through a plane indicated by section line 5—5 in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail, and initially to FIGS. 1 and 2, it will be observed that a marking device generally denoted by reference numeral **10** is shown installed laterally adjacent to a conveyor **12** through which a plurality of articles **14** are continuously conveyed past the marking device. It will be appreciated, that the marking device could be differently arranged in operative relation to other types of continuously conveyed materials including for example sheets of material. By way of example however, the marking device **10** illustrated in FIGS. 1 and 2 is mounted for angular displacement about a vertical axis extending through the pivotal mounting portion **16** of a mounting arm **18**, the opposite end of which rotatably mounts a printing or marking wheel **20**. The mounting arm **18** may accordingly be urged in one angular direction by a spring device **23** for example so as to yieldably hold the printing wheel in engagement with the articles **14** with a sufficient pressure to transfer the ink from the printing type **22** onto the surface being marked. In the embodiment illustrated, engagement between the printing wheel and the article **14** being marked, causes rotation of the printing wheel and toward this end the printing wheel is provided with a pair of spaced friction engaging rims **24**. Rotation imparted to the printing wheel drives a transfer roller **26** projecting from an adjustable ink reservoir device generally referred to by reference numeral **28**. The ink reservoir device is adjustably mounted by means of the pivotal arm **30** on the mounting arm **18** for the printing wheel. The driving connection between the printing wheel and the transfer roller **26** is established by means of the pulleys **32** and **34** which are drivingly interconnected by a crossed drive belt **36** arranged to impart rotation to the transfer roller in such a direction and at such a speed relative to the printing wheel that the contact surface portions of the printing wheel and the transfer roller will be in substantially perfect rolling contact or moving at the same instantaneous linear speed. Ink coating the transfer roller may thereby be properly transferred to the type **22** as it engages the transfer roller. It should of course be appreciated, that other driving facilities for both the printing wheel and the transfer roller may be provided.

Referring now to FIGS. 3, 4 and 5, it will be observed that the ink reservoir device **28** includes a reservoir housing formed by an annular, cylindrical wall **38** the axial ends of which are in engagement with the end walls **40** and **42** to enclose a reservoir chamber sealed by the annular sealing ring **43** within which an ink absorbent body **44** is disposed. The end wall **42** includes an opening aligned with the end sleeve portion **48** of the pivotal arm **30** as more clearly seen in FIG. 3. The sleeve portion **48** receives the external section **49** of a shaft

member **50** the opposite threaded end of which is connected to an assembly knob **52**. A clamping washer **54** is disposed axially between the knob **52** and the end wall **40** so that by rotating the knob **52**, it may bear against the washer and clamp the end walls **40** and **42** in engagement with the annular wall **28** to hold the reservoir housing in assembled relation. The shaft member **50** through which the parts of the housing are assembled or disassembled, includes a spacing section **56** embedded within the ink absorbent body **44**. The ink absorbent body is thereby held in proper position within the reservoir chamber sealingly enclosed by the assembled housing.

Also journalled by bearings **60** and **62** in the end walls **40** and **42**, is the drive shaft **58** to which the pulley **34** is connected at one end externally of the housing. Fixedly mounted on the shaft **58** internally of the housing is a tubular core **64** for the transfer roller **26**. The transfer roller projects from the annular wall **38** of the housing with a close fit through an opening **65**. The transfer roller thereby substantially closes the reservoir chamber leaving only a small air vent.

As more clearly seen in FIG. 4, the transfer roller **26** is in continuous and firm wiping engagement with the body of absorbent material **44** along the surface **66**. Also, the absorbent body **44** is in engagement with the end walls **40** and **42** of the housing and with the internal surface of the annular wall **38** so as to completely occupy a major portion of the volume enclosed by the reservoir chamber leaving only a chordal portion **68** unoccupied. In this fashion, most of the external surface of the absorbent body contacts the internal surfaces of the reservoir housing and the transfer roller **26** so as to minimize exposure to air. The reservoir device may be charged with a quick drying type of ink through an opening in wall **38** closed by plug **69** for storage within the absorbent body material **44** with a minimum amount of drying. Alternatively, the opening and plug **7** may be provided on the end wall **40** as shown by dotted line in FIGURE 1. The ability of the ink reservoir device to store and regulate feed of quick drying ink, represents a significant feature of the invention.

The quantity of ink fed to the printing wheel is adjustable by means of an ink feed regulator **70**. As more clearly seen in FIGS. 4 and 5, the regulator **70** includes a yieldable leaf spring **72** disposed within the chordal section **68** of the reservoir chamber having a portion thereof anchored to the annular wall **38** by the fastener assemblies **74**. The free end of the yieldable leaf spring **72** is secured to a bracket **73** rotatably mounting a wiper roller **76** yieldably held in wiping engagement with the transfer roller. Dependent upon the pressure with which the wiper roller **76** engages the transfer roller, the transfer of ink will be limited to some predetermined amount because of the return of any excess when the transfer roller is rotated in a counterclockwise direction as viewed in FIG. 4. The contact pressure with which the wiper roller engages the transfer roller may therefore be adjusted in order to adjust the ink feed rate by means of an adjustment screw element **78** threadedly mounted in the annular wall **38** and projecting radially inward to engage the leaf spring member **72**. The end of the screw element **78** externally of the reservoir housing is connected to an adjustment knob **80** while a spring **82** is mounted about the screw element between the annular wall **38** and the adjustment knob **80**. The bias of the spring **82** therefore holds the screw element in any position to which it is adjusted corresponding to a preset wiping pressure and ink feed rate.

What is claimed as new is as follows:

1. In combination with an ink reservoir housing having an opening through which an ink transfer roller projects into rolling contact with a marking wheel, wherein the improvement comprises, an ink absorbing body filling a major portion of said housing in contact with the transfer roller leaving a chordal portion empty, said transfer roller being exposed to the empty chordal portion of the housing, a wiper roller disposed within the empty chordal portion of the housing, yieldable means rotatably mounting the wiper roller in contact with the transfer roller for removing ink therefrom in excess of a predetermined amount and adjustable means engageable with the yieldable means for varying the contact pressure between the wiper and transfer rollers to regulate the quantity of ink transferred to the marking wheel, said housing including an annular wall within which said opening is formed, a pair of axial end walls engageable with the annular wall and the ink absorbing body, assembly means extending axially through the ink absorbing body for holding the same in contact with the transfer roller and an arcuate portion of the annular wall while clamping the end walls in engagement with the annular wall, said yieldable means including a leaf spring element anchored to said annular wall in spaced relation to the transfer roller, said adjustable means including a screw element threadedly mounted in the annular wall projecting radially inward into engagement with the yieldable means, an adjustment knob connected to the screw element externally of the housing and a spring mounted on the screw element between the annular wall and the adjustment knob.

2. The combination of claim **1** wherein said assembly means comprises a spacer embedded in the ink absorbing body axially spacing said end walls, a screw section connected to said spacer externally of the housing, and a clamping knob threadedly mounted on the screw section externally of the housing in engagement with one of the end walls.

3. In combination with an ink reservoir housing having an opening through which an ink transfer roller projects into rolling contact with a marking wheel, wherein the improvement comprises, an ink absorbing body filling a major portion of said housing in contact with the transfer roller leaving a chordal portion empty, said transfer roller being exposed to the empty chordal portion of the housing, a wiper roller disposed within the empty chordal portion of the housing, yieldable means rotatably mounting the wiper roller in contact with the transfer roller for removing ink therefrom in excess of a predetermined amount and adjustable means engageable with the yieldable means for varying the contact pressure between the wiper and transfer rollers to regulate the quantity of ink transferred to the marking wheel, said housing including an annular wall within which said opening is formed, a pair of axial end walls engageable with the annular wall and the ink absorbing body, assembly means extending axially through the ink absorbing body for holding the same in contact with the transfer roller and an arcuate portion of the annular wall while clamping the end walls in engagement with the annular wall, said assembly means including a spacer embedded in the ink absorbing body axially spacing said end walls, a screw section connected to said spacer externally of said housing, and a clamping knob threadedly mounted on the screw section in engagement with one of the end walls, said adjustable means including a screw element threadedly mounted in the annular wall projecting radially inward into engagement with the yieldable means, an adjustment knob connected to the screw element externally of the housing and a spring mounted on the screw element between the annular wall and the adjustment knob.

4. In combination with a marking wheel and an ink reservoir housing having an opening through which an ink transfer roller projects for preventing leakage of ink, wherein the improvement comprises an ink absorbing body made of solid material within which the ink is stored filling a major portion of said housing in contact with the transfer roller leaving an empty void in the housing, said transfer roller being partially exposed to the empty

void in the housing, a wiper roller disposed within the empty void of the housing, yieldable means rotatably mounting the wiper roller in contact with the transfer roller for removing ink therefrom in excess of a predetermined amount and adjustable means engageable with the yieldable means for varying the contact pressure between the wiper and transfer rollers to regulate the quantity of ink transferred to the marking wheel, said adjustable means including a screw element threadedly mounted by the housing and projecting radially inward into engagement with the yieldable means, an adjustment knob connected to the screw element externally of the housing, and a spring mounted on the screw element between the housing and the adjustment knob.

5. The combination of claim 4 wherein said yieldable means includes a leaf spring element anchored to said housing in spaced relation to the transfer roller.

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