Aug. 17, 1965 W. KASERMANN 3,200,742

PRINTING APPARATUS

Filed Dec. 27, 1962

Fig. 1

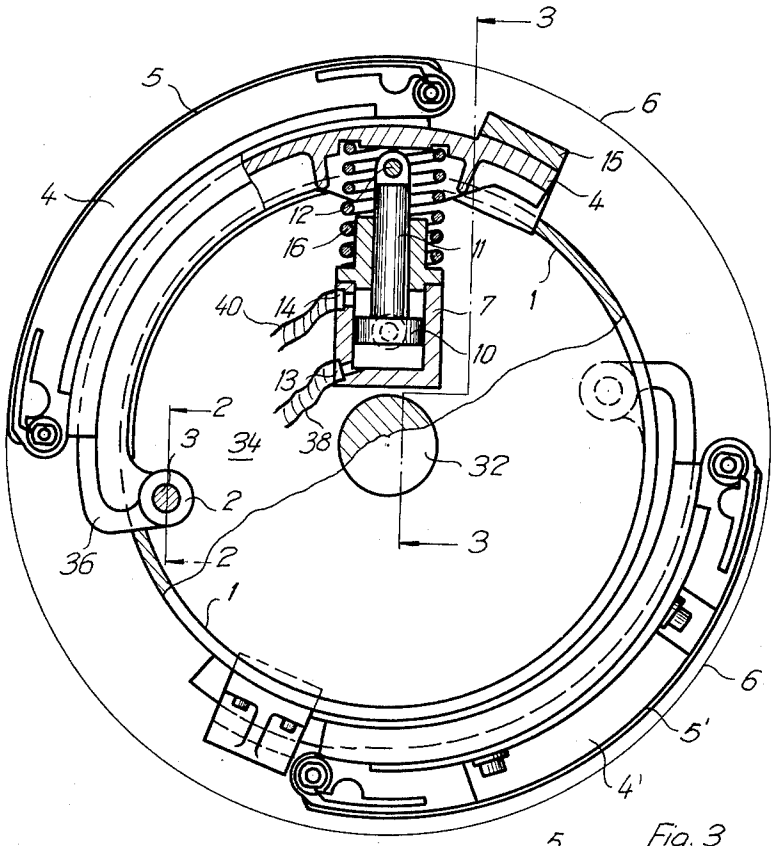


Fig. 2

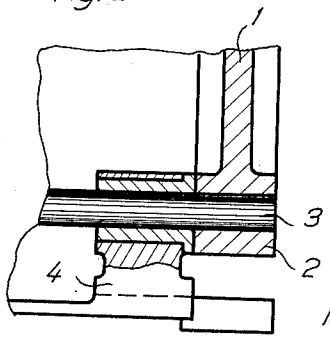
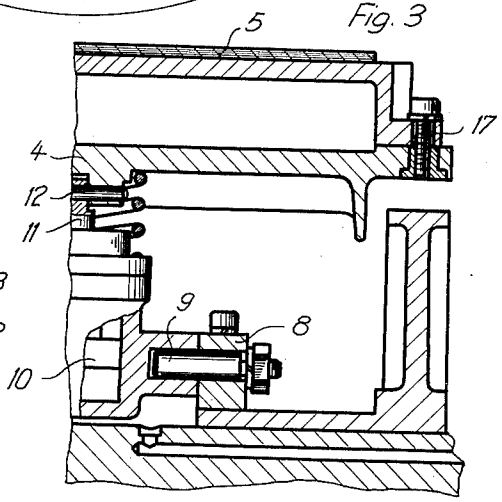


Fig. 3



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3,200,742

PRINTING APPARATUS

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1 Claim. (Cl. 101—247)

This invention relates in general to printing rollers, and in particular to a new and useful printing roller construction having a printing segment pivotally mounted adjacent the periphery thereof and movable between an operative position disposed along a circumferential printing line and an inoperative position moved inwardly therefrom.

In the known printing machines for printing hollow bodies such as pipes, tubes, cans or similar objects, the hollow bodies are placed, either manually or by means of automatically operating devices, on holding devices which are arranged on so-called turrets or revolving plates. These holding devices are distributed over the circumference of the turrets. At least one printing segment is secured on a cylinder of a printing roller. The printing segment is embraced by a rubber cloth. The rubber cloth is then inked with one or several colors by means of an inking and printing device. The revolving turret or plate which is usually mounted on an adjustable slide and which carries the hollow body to be printed at its circumference, is then brought into a printing position. In the printing position, the individual hollow bodies are rolled along each rubber cloth, whereby they are imprinted with one or several colors. The holding devices for such hollow bodies are usually constructed in the form of rotatable mandrels. It sometimes happens that during the operation of the machine, one or more of the mandrels do not carry any hollow bodies. In order to prevent that in such an instance ink may reach the mandrels, sensing devices are employed to serve as a control so that the adjustable slide is moved away from the revolving turret and the hollow bodies moved out of alignment with the printing segment, so that the empty mandrels may be moved into position outside the printing line or area.

With machines of the above character, the arrangement described has the disadvantage that a large mass thus has to be displaced. In this connection, it should be observed that such adjustable slides always have a certain play which, of course, results in inaccurate printing so that the final printing is not satisfactory.

Further strip printing devices have become known for printing strips or hose-like materials made of polyethylene, paper, cellophane, aluminum foil, or similar materials. These strips to be printed are wound from a spool and are fed to a printing station and then advanced to a winding or cutting device. In such arrangements, there is the disadvantage that in the absence of a strip adjacent the printing station, the printing roller is inked at the printing station so that an undesirable printing on the rearside of the strip takes place. In such arrangements, the printing station also consists of a printing segment having a rubber cloth cover.

In accordance with the invention, there is provided a printing roller which includes one or more printing segments, at least one of which is pivotally mounted adjacent its one end and the opposite end is held in an operative position by means of a control member which may effectively pull the segment so that the printing cloth stretched over the exterior periphery thereof will be moved out of the line of printing.

In a preferred arrangement, the printing segments are advantageously mounted at the one end for pivotal

movement about a bolt member having an axis substantially parallel to the axis of the printing cylinder, and the opposite end is engaged by a control member which may advantageously include a piston rod connected to a piston member which may be moved under the control of pressurized fluid for shitfing the rod and the opposite end of the printing segment. The piston rod and the segment are advantageously biased outwardly against the stop for positioning in an accurate operative position with the rubber cloth stretched along the circumferential printing line. The control member is advantageously movable to permit the adjacent end of the segment to be moved inwardly toward the center of the cylinder and bring the entire printing segment with the cloth out of the line of printing.

Accordingly, it is an object of this invention to provide an improved printing cylinder construction.

A further object of the invention is to provide a printing cylinder which includes a printing segment pivotally mounted thereon for swinging movement about an axis substantially parallel to the axis of the cylinder and which includes control means at the opposite end thereof for shifting the segment inwardly and outwardly for positioning the segment printing portion in either an operative or inoperative position.

A further object of the invention is to provide a printing cylinder which includes a segment pivotally mounted thereon and movable between operative and inoperative positions at which a printing cloth of the segment is exposed either along a circumferential printing line or in an inoperative position at a location spaced inwardly therefrom.

A further object of the invention is to provide a printing cylinder construction which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out in the claim annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages, and specific objects attained by its use, reference should be had to the accompanying drawings in which a preferred embodiment is illustrated, and the accompanying description in which the same is described.

In the drawings:

FIG. 1 is a partial side elevation and partial section of a printing roller constructed in accordance with the invention;

FIG. 2 is a fragmentary section taken on the line 2—2 of FIG. 1; and

FIG. 3 is a section taken on the line 3—3 of FIG. 1.

Referring now to the drawings in particular, the invention embodied therein comprises a printing cylinder or roller generally designated 30 which is affixed to a shaft 32 which is rotatably mounted in suitable bearings (not shown).

In accordance with the invention, the printing cylinder 30 includes a cylindrical shell portion or segment carrier 1 which is recessed, as at 34, to provide a cavity for the mounting of a printing segment generally designated 4. The segment 4 is pivotally mounted by means of an arm 36 having a bearing eye 2 which extends over a pivot pin or bolt member 3. The arm 36 with the segment 4 is rotatable about the bolt 3. The segment 4 carries a rubber cloth 5 mounted in a manner so that when the segment is in an operative position, the cloth extends along a printing line 6. The segment carrier 1, together with the printing segment 4 and the rubber cloth 5, forms a rotating printing cylinder.

As indicated in FIG. 1 in the top portion, the printing segment 4 is shown in the printing position, that is, the rubber cloth 5 lies exactly on the printing line 6.

In the lower portion of the drawing of FIG. 1, the printing segment 4' lies in an unoperative position with the rubber cloth 5' moved inwardly away from the printing line 6.

In accordance with a feature of the invention, the control of the movement of the printing segments 4 and 4' between the operative and inoperative positions is accomplished by control means such as a control cylinder 7 for pressurized fluid such as water. The cylinder 7 is mounted in bearings 8 and is rotatable about a bolt 9, as indicated in FIG. 3.

Within the cylinder 7 there is inserted a piston 10 having a piston rod 11 which is connected by means of bolt 12 to the free end of the printing segment 4. Flexible tubes or lines 38 and 40 are connected through ports 13 and 14, respectively, to the interior space of the cylinder 7 on opposite sides of the piston 10.

Flexible conduits 38 and 40 are connected to a pressure source (not shown) and each line is pressurized by means of a control device (not shown) to shift the position of the piston 10 and hence of the segment 4 in accordance with desired operational conditions. The control device is operated in a manner to insure that the printing segment 4 is lifted away from the printing line 6 when there is no object to be printed, for example, as when there is no object held by a mandrel in an automatic printing machine. When the piston 10 is moved downwardly by pressurizing the conduit 40, the segment 4 is shifted, as indicated in the lower portion of FIG. 1, to a position moved inwardly from the printing line 6. In this manner, the printing cloth 5 will not touch a workpiece supporting mandrel or the printing roller and no undesirable printing or smearing of the backside of the object to be printed or the mandrel, for example, will occur.

The segment carrier 1 is provided with an abutment 15 against which the outer end of the segment 4 abuts when in an operative position. The segment 4 is biased into an operative position by means of a coil spring 16 which extends around an extension of the cylinder 7 and is held between such extension and a recessed portion of the underside of the segment 4. The abutment 15 is located to insure that the segment 4 is not pressed beyond the printing line 6. The same effect may be obtained by providing a limit means within the cylinder 7 to limit the movement of the piston 10. Any suitable means may be provided for controlling the positioning of the printing segment 4 which may be connected to the end opposite the end which is pivoted on the bolt 3.

The printing segment 4 is advantageously made of two parts which are connected together by screw 17, as indicated in FIG. 3. In this manner, it is possible to vary the outer portion with the rubber cloth and the outer portion may be interchanged for changing the size of such cloth and for providing a proper registering arrangement therefor.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

A printing apparatus comprising a cylindrical shell, a printing segment including an arm portion pivotally mounted adjacent the periphery of said shell portion, and a curved portion extending outwardly therefrom around in a circular arc and defining means for accommodating a printing cloth thereon, an abutment defined as an extension of said printing shell, the portion of said segment opposite from the portion which is pivotally mounted being aligned for movement outwardly against said abutment when in an operative position with the outer periphery disposed along a circumferential line of printing, a control cylinder pivotally mounted on said cylindrical shell, a piston movable in said control cylinder and having a connecting rod pivotally connected to said segment adjacent the end opposite the end which is pivotally mounted on said shell, a coil spring compressed between said cylinder and said segment for biasing said segment outwardly against said abutment, and means for admitting pressurized fluid to said cylinder on selected sides of said piston for controlling the position of said piston and said segment in respect to the circumferential line of printing.

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