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H. F. GUNDLACH

2,114,378

PRINTING ROLL

Original Filed Nov. 30, 1936

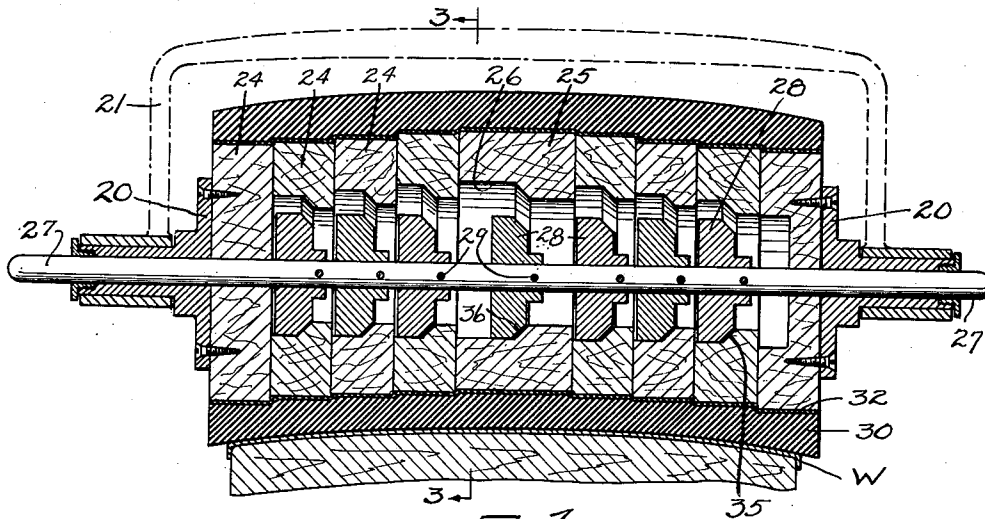


FIG. 1

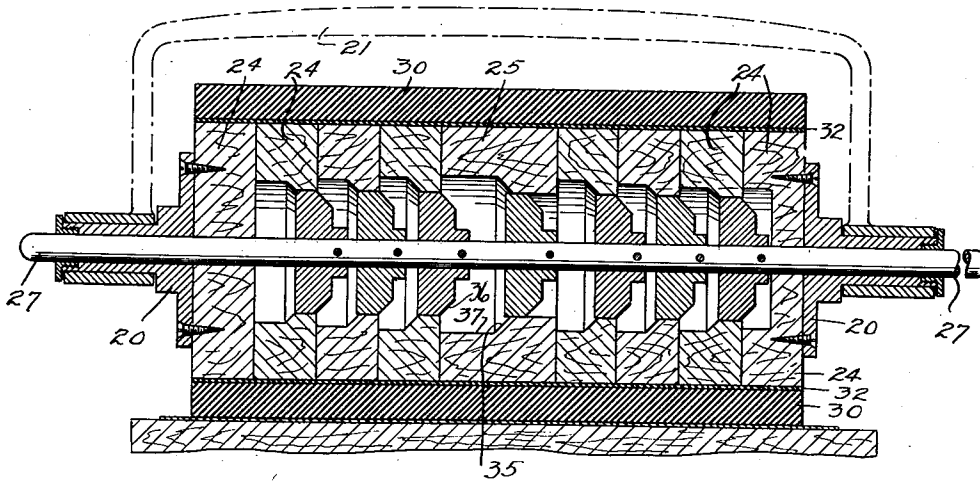


FIG. 2

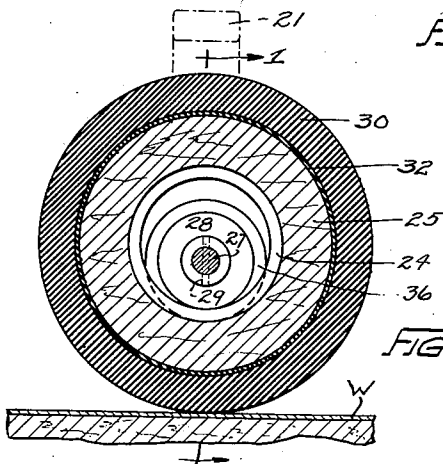


FIG. 3

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UNITED STATES PATENT OFFICE

2,114,378

PRINTING ROLL

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Original application November 30, 1936, Serial
No. 113,406. Divided and this application July
26, 1937, Serial No. 155,644

9 Claims. (Cl. 101—154)

This application relates to a printing roll, and especially to a transfer printing roll for use in offset printing processes. The present application is a division of my copending application, Serial No. 113,406, filed November 30th, 1936. The general object of the present invention is to provide a deformable transfer roll, which may be brought into contact alternately with a flat surface and an uneven surface, and substantially the same contact pressure maintained over all portions of either surface with which the roll is contacting.

Another object of the present invention is to provide an improved deformable transfer roll, which may be alternately brought into contact with a flat surface and an uneven surface, and which will be arranged to transmit the same pressure to either surface, and when used in connection with a flat surface, which roll is so arranged that it may be locked against deformation and readily released on alternate cycles of operation of the roll.

These and other objects of the present invention will become more apparent from the following description, which relates to the accompanying drawing, illustrating a preferred form of the invention. The essential characteristics of the invention will be set forth in the claims.

In the drawing, Fig. 1 is an axial section taken through my improved transfer roll; Fig. 2 is an axial section, similar to Fig. 1, but illustrating the parts in a different position; Fig. 3 is a transverse section through the roll, as indicated by the line 3—3 on Fig. 1.

My improved transfer roll is supported by a pair of end plates 20, which are secured to the opposite ends of the roll and are rotatably mounted in bracket formations, indicated by the dotted lines 21, which serve to maintain the end plates in a predetermined spaced relationship, and in alignment with each other.

The roll has a core comprising a plurality of relatively circular rings or sections, there being comparatively thin rings, indicated at 24, near the end portions of the roll, and a thicker ring 25, at the axial center of the roll. These rings 24 and 25 are each provided with enlarged central openings 26, so that all sections may shift radially relative to each other to bring the roll into and out of a cylindrical arrangement. Extending axially through the openings 26 in the rings 24 and 25, and slidably mounted in the end plates 20, is a shaft 27. The shaft surface adjacent the annular rings 24 and 25 comprises, as shown, discs 28, all of which are rigidly secured to the shaft 27,

as by pins 29. These discs are spaced from each other and each disc is arranged to coact with the internal surface of respective rings to deform the roll and cause its periphery to conform substantially with the contour of the work with which the roll is to be used.

Embracing and peripherally enveloping all of the rings 24 and 25, is a cylindrical hollow body of material adapted to effect a transfer of the decorative medium from a pattern to the work. This transfer material is shown as one continuous piece 30 and may comprise the usual glue and glycerin compound, which, in the past has been found suitable for transferring a design from the pattern to the work in offset printing processes.

Intermediate the transfer material and the rings 24 and 25 is a tubular member or sleeve, of stretched elastic 32, which substantially envelops all of the sections of the roll. Preferably, this sleeve is of live rubber and is individually attached to the peripheral surfaces of the respective rings, as explained in detail in the copending application of Edward William Hamant, Serial No. 88,367, filed July 3rd, 1936, and assigned to my assignee, Oxford Varnish Corporation.

The roll of the present invention is provided with rings, the internal diameters of which vary in size, while the discs 26 all have the same external diameter. The effect, however, is substantially the same as that shown and described in the application above referred to, wherein the openings in the rings are of the same diameter, the diameters of the discs varying. In the roll of the present invention, however, each ring is provided with a pair of openings, one of which openings 37 has the larger diameter, as heretofore described. The other opening, as indicated at 38, has substantially the same diameter as its corresponding disc 28. These two openings in each ring 24 and 25 are concentric with each other, and are joined by internally bevelled walls 35. These walls 35 cooperate with bevelled shoulders 36 of respective discs 28 to cause the rings 24 and 25 to be cammed into axial alignment with each other and the shaft 27, consequent upon the movement of the shaft axially through the end plates 20 from the position illustrated in Fig. 1 to the position illustrated in Fig. 2.

When the shaft is in the position shown in Fig. 2, each of the discs 28 cooperate with its ring opening 38 and maintains the ring in axial alignment with each other, thus maintaining the roll in a true cylindrical form.

When, however, the shaft 27 is moved to the

position shown in Fig. 1, the discs 28 cooperate with the enlarged openings 37, permitting the rings to move, one relative to the other, and consequent upon pressure being applied to the shaft to bring the roll into contact with the work, such as that shown at W in Fig. 2. Each disc 24 and 25 cooperates with the surface of the enlarged opening 37 in its respective rings and applies the pressure of the roll to the work substantially even throughout the entire length of the roll, thus enabling the design to be removed from the pattern and applied to the work with substantially the same pressure throughout the entire contact area of the roll, with either the pattern or the work, even though the surface contour of the pattern varies from the surface contour of the work.

From the forgoing description it will be seen that my invention includes an improved transfer roll, readily adaptable either for manual operation or for use in a machine such as that shown in my copending application, heretofore referred to, and which roll may be either manually or automatically actuated, and rolled across the pattern and work.

I claim:

1. A transfer member, having a base, formed of relatively stacked sections of substantially non-yielding material, each individual section being shiftable in its own plane, yieldable transfer material extending across the base sections, one to the other, and selectively operable means cooperable with adjacent sections, to hold in alignment the surfaces of the adjacent sections which are closest to the transfer material.

2. In a transfer roll having a core formed of relatively radially shiftable sections of substantially non-yielding material, selectively operable means acting on the core sections to hold the sections in prearranged relationship as desired.

3. A transfer roll having a core formed of relatively radially shiftable annular sections of substantially non-yielding material, a tubular body of yieldable transfer material enveloping the sections, and selectively operable means carried by the roll to hold the sections in a prearranged relationship to each other.

4. A normally cylindrical transfer roll, comprising a core formed of a plurality of circular discs of substantially non-yielding material mounted upon a shaft, the discs being shiftable radially relative to each other and to the shaft, and means carried by said shaft and selectively operable to maintain the discs in longitudinal cylindrical alignment, and an outer layer of material which is adapted to effect a decorative transfer enveloping said discs.

5. A transfer roll, having a core formed of relatively radially shiftable hollow sections of substantially non-yielding material, a yieldable transfer material overlying said sections, axially

movable means within said sections to act positively thereon to prevent the sections from moving out of cylindrical alignment to permit such movement as desired.

6. In a transfer roll, having a core formed of relatively radially shiftable sections of substantially non-yielding material and an envelope of yieldable transfer material surrounding the core, each section having two axially extending aligned openings therein, one opening being larger than the other opening, and means adapted to co-act selectively with either one of said openings in each section to control the shifting of said sections.

7. A transfer roll comprising a plurality of stacked sections mounted on a shaft, certain of said sections being radially movable relative to other sections and said shaft, resilient means normally acting to maintain the external surfaces of said sections in alignment, means acting on the sections to positively force their external surfaces out of alignment consequent upon pressure being applied to said shaft to bring the roll into engagement with a workpiece, and means acting on said sections to positively align their external surfaces when pressure is applied on said shaft to bring the roll into contact with a pattern.

8. A deformable transfer roll comprising a plurality of relatively shiftable core sections of a substantially non-yielding material, a blanket of resilient transfer material common to and enveloping all of said sections, resilient means to normally maintain said sections in peripheral alignment with each other, and means acting on said sections and arranged and adapted to apply pressure to said sections to urge the transfer material into contact with an object, said last-named means being shiftable to move said sections out of alignment with each other or into alignment with each other consequent upon pressure being applied thereto.

9. A transfer roll comprising a shaft and substantially rigid rings in side-by-side relation, each ring being shiftable in its own plane relative to adjacent rings, said rings being assembled on the shaft and having two openings loosely embracing the shaft, a series of discs carried by said shaft and movable axially relative to the rings, one of the openings in each of said rings having a diameter greater than the diameter of one of the openings in the rings and substantially the same size as the other opening, a cylinder of transfer material enveloping the discs and distortable out of cylindrical shape by relative movement of the rings, said discs being arranged to cooperate selectively with either set of openings to limit the shifting movement of the discs and thereby control the effective transfer surface of the roll at one side of the axis thereof.

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