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WORK DECORATING METHOD AND IMPLEMENT

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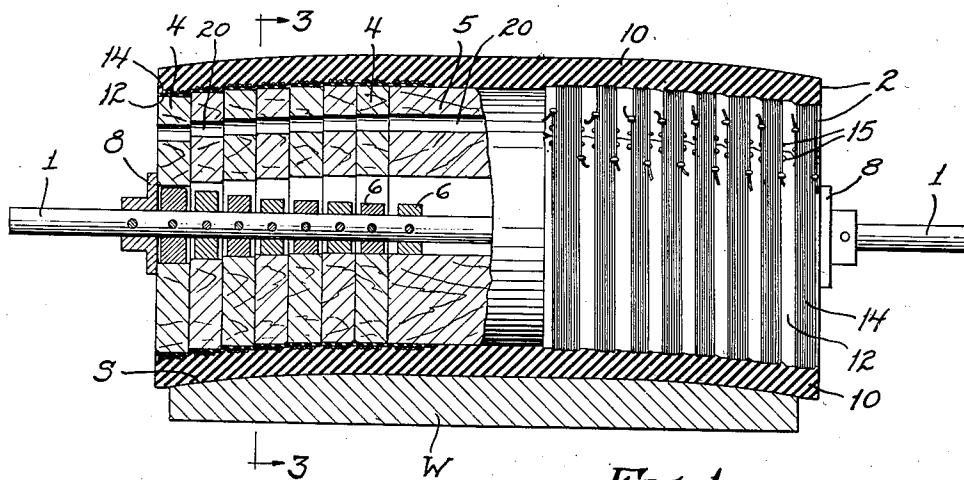


Fig. 1

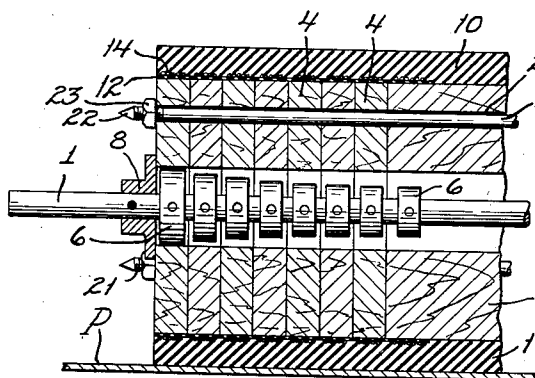


Fig. 2

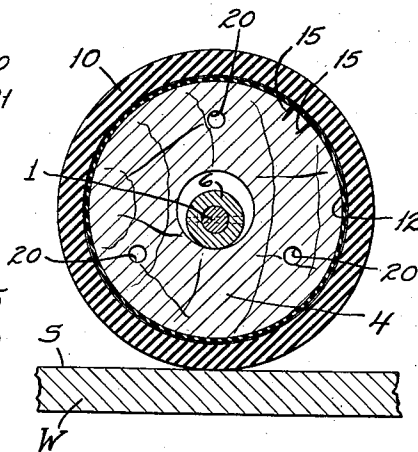


Fig. 3

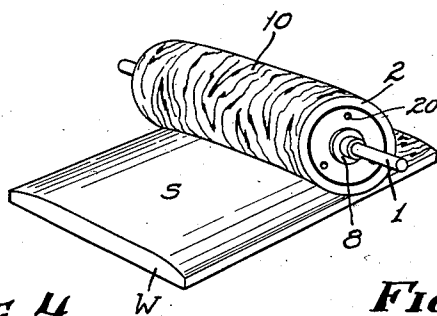


Fig. 4

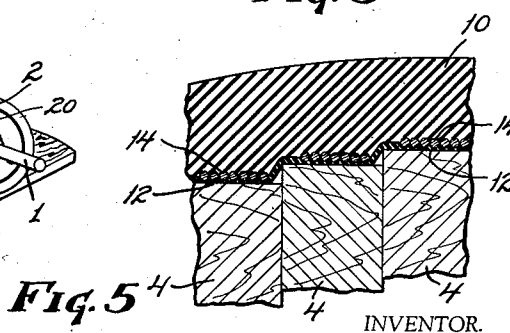


Fig. 5

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WORK DECORATING METHOD AND
IMPLEMENT

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13 Claims. (Cl. 101—35)

The principal object of this invention is to provide an improved work-decorating member of the type adapted to be pressed into contact with a "pattern" surface, bearing an image in suitable medium, such as ink or paste, and then to transfer the medium delineating such image to an object to be decorated. One problem in connection with apparatus of such type arises by reason of the fact that the pattern-carrying member (usually an etched or otherwise suitably engraved surface on which the decorating medium is distributed to form the pattern) may only be made economically either as a flat or regularly curved plate, although the work to be decorated may vary infinitely in surface shape.

A specific object is to provide a work-decorating transfer member which will be positive in its action in applying the decorative imprint to the work, notwithstanding that the shape of the work may vary within reasonable limits, and which will cooperate effectively with a flat or cylindrical pattern surface in removing the decorating medium therefrom in the transfer process.

A further object is to provide an improved work-decorating method.

Other objects and features of the invention will become apparent from the following description, relating to the accompanying drawing, showing an illustrative form of apparatus for utilizing it.

In the drawing, Fig. 1 shows, partially in side elevation and partially in longitudinal central section, a transfer roll embodying the invention, as being applied to an article to be decorated; Fig. 2 shows one end of the roll of Fig. 1, being applied to a flat pattern, such as an etched plate; Fig. 3 is a transverse sectional view, through the entire roll, taken as indicated by the line 3—3 on Fig. 1; Fig. 4 is a perspective view, showing the application of the roll to a surface to be decorated; and Fig. 5 is a sectional detail view, showing features of the construction of the roll.

Referring in detail to the drawing, a supporting shaft is shown at 1, on which the transfer roll, indicated generally at 2, is mounted. The shaft has its ends projecting from the roll and these ends may be supported directly by hand or in suitable sleeves rotatably engaging the ends, or the ends of the shaft may be supported in appropriate bearings, in a work-decorating machine of any known or suitable type, provided with a rotary pattern member, a work support, and suitable driving mechanism. It may be assumed that the roll as shown is to be supported directly by hand.

The roll has a core comprising relatively stacked circular discs, there being comparatively thin discs, as indicated at 4, near the end portions of the roll, and a substantially thicker disc 5 at the longitudinal center of the roll. These discs 4 and 5 have central openings, which are normally in alignment as shown in Fig. 2, but which are larger than the effective shaft, so that all the sections may shift relative to the shaft as well as to each other, into and out of cylindrical arrangement. The effective shaft surfaces adjacent the sections comprise, as shown, rings 6, all of which are secured rigidly to the shaft per se as by cross-pins, it being understood, however, that the ring effects shown may be formed directly on the shaft stock. The rings 6 are spaced from each other, and each is located centrally with respect to the discs surrounded thereby, so that the rings may be made on various diameters and each control the extent of lateral movement of but one of the discs, without interfering with the other discs. The diameters of the rings, in the embodiment shown, increase toward both ends of the roll.

The discs 4 and 5 are held in assembled relationship by end plates 8, shown as pinned to the shaft. One or both of these end plates may be adjustable, and secured to the shaft as by means of a jam-nut, (not shown), whereby the effective pressure between the discs may be controlled and set. In case the roll is to be driven by means of the shaft, as in a graining machine, any suitable key arrangement may be used between the shaft and one or more of the discs. Such positive driving connection is omitted from the illustration because when the roll is used by hand, no driving from the shaft is necessary, the shaft being used only as a guiding support.

Embracing and peripherally enveloping all the discs there is shown a cylindrical, hollow body of material adapted to effect transfer of the decorative medium in the manner above indicated. This as shown is in one continuous piece 10, (Figs. 1 and 3). The transfer material 10, may, of course, comprise non-continuous sections and need not circumferentially envelope the core but in any event the transfer material bridges two or more of the non-yielding sections longitudinally of the roll. The laterally shiftable sections are maintained normally in cylindrically aligned relationship, partly by means of the elastic nature of the transfer material, which, as usually made comprises glue and glycerin compound, but which may comprise any other suitable transfer material.

Assisting in the action of the transfer material in normally maintaining the sections in cylindrical alignment, there is shown a pre-stretched sheet of live, elastic rubber 12, which bridges and substantially envelopes all the sections at one end of the roll and which may bridge and envelope all the sections of the roll if desired. Preferably this sheet of live rubber is individually attached to the peripheral surfaces of the respective discs and the attachment may comprise binding cords 14, sections, of cord being wound about the assembled core and enveloping sheets 12, the ends being fastened to respective discs, as by means of nails or suitable fasteners 15, see Fig. 3.

The enveloping tube 10 of transfer material is usually molded under pressure about the core after the latter is formed and assembled as above described. The layers of cord 14 assist in forming a secure bond between the rubber and the transfer composition. It will be seen that relatively free stretches of rubber bridge across from the peripheral surface of one disc to that of another and when, due to any agency, the discs are relatively offset, as shown in Fig. 5, said free stretch of the rubber sheet tends strongly to realign the sections in cooperation with the transfer material which is also ordinarily both yielding and elastic.

In the operation of the roll in carrying out the method, the yieldably aligned sections, as shown in Fig. 2, tend to maintain the transfer material in cylindrical form while the outer surface of the transfer blanket is rolled into contact with, for example, an etched surface of a metal plate, such as indicated, at P, in Fig. 2. This may be planar or cylindrically curved, and, in either case it will be seen that the roll operates on the plate at best advantage with the sections 4 and 5 aligned. After the ink pattern has been picked up by the transfer surface the latter is then rolled onto the work surface to be decorated, such being indicated at S on the work blank W, in Figs. 1, 3, and 4. Assuming that the surface of the work is transversely curved, and bi-symmetrical as shown, it will be seen that, as pressure is applied to the roll, the central section 5 moves laterally of the shaft the greatest distance, and that the other sections move corresponding lesser distances, as determined by the shape of the work. The rings cooperate in maintaining the desired relationship between the sections, and it is to be understood that the driving shaft and ring arrangement may readily be made demountable from the roll, so that the shaft shown may be replaced by another shaft having ring diameters to suit various shapes of work other than that shown. Thus positive abutment may be maintained between the effective shaft and the shiftable sections, such as always to apply uniform pressure of all the sections on the transfer material for the entire operative extent thereof across the work. The particular shape of work is illustrative only.

It is frequently desirable to prevent by positive means lateral movement, out of cylindrical alignment, between the sections 4—5 of the roll. During shipment of transfer rolls, the usual method is to support the rolls on stanchions or blocks which engage the projecting ends of the shafts, thereby preventing contact of the transfer material 10 with any supporting surface. When the present roll is so supported, the weight of the central sections 4 or 5 of the roll will have a tendency to pull the roll out of cylindrical shape, and if the roll is shipped for a considerable

distance, the transfer material may be permanently distorted thereby. To prevent this (inter alia) a series of normally aligned openings 20 are provided in the sections, and after the roll is formed and assembled, as above described, suitable rods 21 are thrust through the openings, holding the sections substantially in cylindrical alignment. As shown, these rods have at least one pointed end 22 to assist in inserting them, and the rods, adjacent the pointed ends, are threaded to engage securing nuts 23. The opposite ends of the rods may be similarly made or have rigid heads. Where the only problem is maintaining the roll in cylindrical shape during shipment, a dummy shaft may be used, fitting the enlarged central openings in all the sections, and the operating shaft (shown and described) is, in such case, shipped separately from the roll.

I claim:

1. In a transfer roll having a core formed of relatively laterally shiftable sections of substantially non-yielding material, means acting on the core sections in a manner normally to hold the sections in prearranged relationship.

2. A transfer roll having a core formed of relatively laterally shiftable discs of substantially non-yielding material, and a tubular body of yieldable transfer material enveloping the discs.

3. A transfer roll having a core formed of relatively laterally shiftable sections of substantially non-yielding material, an enveloping cover of yielding material adapted to effect a decorative transfer, and elastic material interposed between the core and cover and normally tending operatively to align adjacent shiftable sections of the core.

4. A transfer roll having a core formed of relatively laterally shiftable sections of substantially non-yielding material, yieldable transfer material outwardly overlying the core, and an elastic membrane interposed between the core sections and the transfer material.

5. A transfer roll having a core formed of relatively laterally shiftable sections of substantially non-yielding material, yieldable transfer material outwardly overlying the core, and a pre-stretched elastic membrane bridging adjacent core sections and interposed between the peripheral surfaces of the sections and the transfer material.

6. 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 relative to each other and to the shaft transversely thereof, an elastic sheet bridging adjacent discs and tending to maintain them in longitudinal cylindrical alignment, and an outer layer of material which is adapted to effect a decorative transfer, surrounding said elastic sheet.

7. A normally cylindrical transfer roll, comprising a core formed of a plurality of discs of substantially non-yielding material mounted upon a shaft, the discs being adapted to be shifted relative to each other and to the shaft, an elastic cover surrounding the discs and tending to maintain them in longitudinal cylindrical alignment, and a coating of impression-receiving material surrounding said elastic material.

8. A normally cylindrical transfer roll, comprising a core formed of a plurality of circular discs of substantially non-yielding material mounted in such manner that the discs are shiftable relative to each other in their own planes, an elastic sheet bridging adjacent discs

and tending to maintain them in longitudinal cylindrical alignment, an outer layer of material which is adapted to effect a decorative transfer, surrounding said elastic sheet, and means securing the elastic sheet to the peripheral surfaces of the discs individually.

9. A transfer roll comprising a shaft and substantially rigid discs in side-by-side relation, each shiftable in its own plane relative to adjacent discs, the discs being assembled on the shaft and having openings loosely embracing it, a cylinder of transfer material enveloping the discs and distortable out of cylindrical shape by relative movement of the discs, and pressure means on the shaft limiting the shifting movement of the discs to control the effective transfer surface of the roll at one side of the axis thereof.

10. In the method of decorating work by transferring an image in suitable color from a pattern to the work, the procedure comprising applying a sheet of yielding transfer material to the pattern, meanwhile yieldingly and continuously supporting the sheet opposite the pattern-surface-contacting area, and then applying the sheet to the work while non-yieldingly and continuously supporting the sheet opposite the work contacting area thereof.

11. A transfer roll, having a core, formed of

relatively laterally shiftable sections of substantially non-yielding material and yieldable transfer material lying outwardly from the core, means associated with the core and acting positively thereon to prevent the sections from moving out of cylindrical alignment.

12. In a transfer roll, having a core formed of relatively laterally shiftable sections of substantially non-yielding material and an envelope of yieldable transfer material surrounding the core sections, a series of normally aligned openings in the sections outwardly from the center thereof, and securing bolts adapted to be passed through said openings to prevent sagging of the roll in shipment.

13. In the method of decorating non-planar work by the use of a sheet of transfer material, the procedure of applying the transfer material to the pattern in a cylindrical form, and then distorting the cylindrically shaped transfer material sufficiently to make it conform to the work at all areas thereof contacted by the transfer material by applying, internally of the cylinder and opposite the working area of the transfer material and intermediate the cylindrical axis and the transfer material per se, a positive equalized pressure to thereby cause said distortion.

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