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W. HOTOP ETAL
PRINTING CYLINDER
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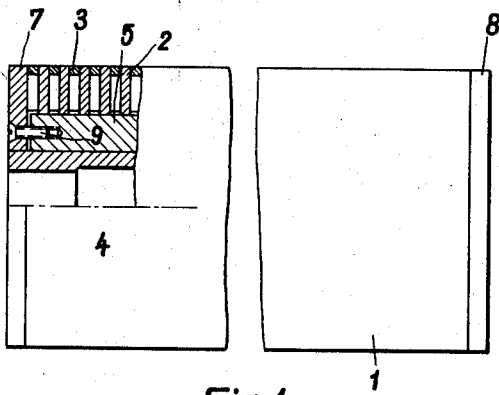


Fig. 1

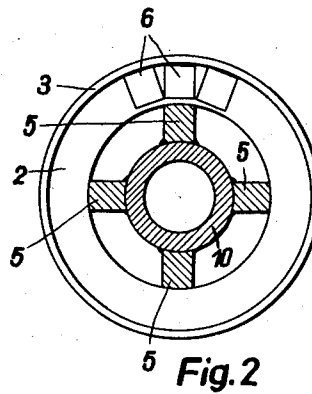


Fig. 2

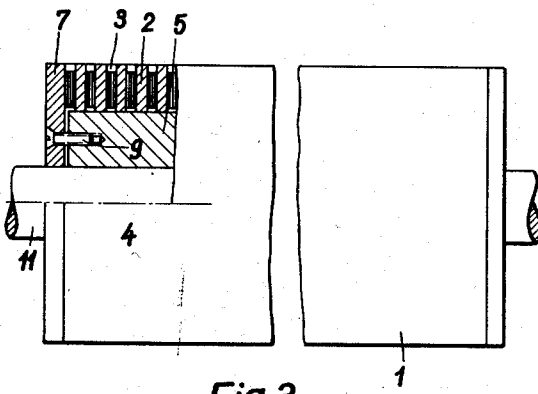


Fig. 3

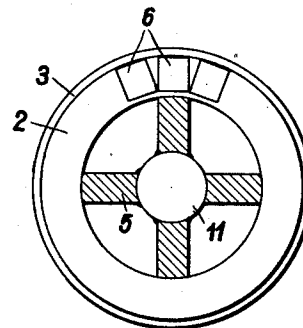


Fig. 4

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PRINTING CYLINDER

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3 Claims. (Cl. 101—378)

The invention concerns a printing cylinder for magnetically holding flexible magnetizable stereo plates. It has been proposed to construct such printing cylinders with a plurality of adjacent strip-like poles extending axially across the cylinder surface and alternating in polarity in the circumferential direction. In order to assure that the magnetizable stereos firmly adhere to this surface the maximum number of poles should be placed as closely together as possible. The lines of force of the resultant magnetic fields will then be concentrated in the immediate vicinity of the surface and all pass through the relatively thin magnetisable layer of the flexible stereo plate.

These printing cylinders which have in practice proved to be very effective are expensive as well as difficult to manufacture, particularly because of the relatively great length of the permanent magnet strips which must be secured to the shaft by means of specially profiled cross sections with the interposition of intermediate members. The slidable insertion of the strips into the profiled cross sections causes considerable difficulties in assembly.

It is the object of the present invention substantially to simplify the manufacture of printing cylinders of the specified kind without abandoning the principle of providing very closely spaced poles.

For solving this problem the inventors have discarded the notion that the pole strips should extend axially across the cylinder surface. Hitherto this was thought necessary to prevent the stereos from being rotatably displaced on the cylinder in the circumferential direction. It has now been found that the necessary force of adhesion to prevent the stereo plates from circumferentially shifting can in fact be provided by embodying the poles in rings placed in close axial adjacency.

The permanent magnets may then be adhesively bonded to one face of the soft iron rings. However, generally it will not be possible to produce rings of the requisite size from a suitable permanent magnet material. The material principally used for this purpose is a sintered oxidic permanent magnet material based on iron (III) oxide/barium oxide which cannot be moulded into rings of appropriate dimensions. The production of annular segments also meets with considerable difficulties. According to a further feature of the invention it is therefore proposed to stick the permanent magnets in the form of small rectangular plates to one face of the soft iron rings. These rings, which carry the permanent magnets adhesively bonded thereto and which are machined on their inside circumference to accurate limits, can be readily pushed on to ribs of non-ferromagnetic material and secured by screws between terminal plates. The poles can thus be spaced closely together without giving rise to the kind of technological problems which are encountered in the production of cylinders with pole strips extending axi-

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ally along the generators of the cylinder surface. Their cost of production is therefore much lower.

Two embodiments of the inventive idea are shown in the drawings and will now be described. In the drawings FIG. 1 is a part sectional view and

FIG. 2 is a vertical section of one embodiment of the invention, whereas

FIGS. 3 and 4 are corresponding representations of a second embodiment.

According to the invention the printing cylinder 1 consists of a plurality of axially aligned adjacent rings, soft iron rings 2 alternating with interposed rings 3 of non-ferromagnetic material. The inside circumference 4 of the soft iron rings 2 is machined to accurate limits to permit them to be slidably fitted on to rib members 5. However, before this is done, small rectangular permanent magnet plates 6 are adhesively bonded to one side of the rings in the manner shown in FIG. 2. The rings 3 of non-ferromagnetic material which are preferably likewise adhesively bonded to the magnetic rings 2 cover the outer edges of the permanent magnet plates 6, so that the external surface of the assembled printing cylinder is entirely smooth. Ring 3 may be an undivided ring but, if desired, it may be composed of a number of segments.

The permanent magnets are preferably magnetised before the rings are pushed on to the rib members 5, the direction of magnetisation being across the thinnest plate section. The rings 2 which carry the magnets 6 are placed together in such a way that the magnets which are bonded to one face of each ring and the magnets which merely contact the other face have the same polarity at the said two interfaces. It will be readily understood that the polarity of consecutive rings 2 in the axial direction thus alternates from ring to ring.

The fitted rings 2 are secured by terminal plates 7 and 8 which are screwed to the ends of the rib members 5, as indicated at 9.

The embodiment illustrated in FIGS. 1 and 2 is intended for a printing cylinder which is supplied to the printers without a shaft. The rib members 5 are therefore welded to a tubular core 10. It may also be mentioned that, instead of the four rib members shown in the drawing, three or more than four rib members might be provided.

Substantially the embodiment illustrated in FIGS. 3 and 4 is identical with that shown in FIGS. 1 and 2 excepting that the rib members 5 are welded directly on to the cylinder shaft 11.

What we claim is:

1. A cylinder for mounting a flexible magnetisable printing plate including co-axial elements each comprising a soft iron annular member and at least one permanent magnet which is magnetised across its thinnest section and is affixed to a diametral face of said member, longitudinal rib members of non-ferromagnetic material, said elements being mounted in axial adjacency on said rib members in such manner as to provide a closely spaced sequence of poles of alternating polarity in the peripheral surface of the cylinder.

2. A cylinder for mounting a flexible magnetisable printing plate comprising a plurality of longitudinal ribs of non-ferromagnetic material and a carrier from which they extend outwards, and a series of co-axial elements supported by said ribs each comprising an annular mem-

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ber of ferromagnetic material and a plurality of plate-like permanent magnets each magnetised across its thickness and secured on one diametral face of said member, a group of said plate-like members being arranged around each said face, said elements being mounted in co-axial relation in such manner that the ferromagnetic members produce poles of alternating polarity in the peripheral surface of the cylinder.

3. A cylinder according to claim 2, in which the said permanent magnets are small rectangular plates a plurality of which are adhesively fixed to and arranged around one diametral face of each said member and comprising rings of non-ferromagnetic material adhesively secured to the

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said ferromagnetic annular members so as externally to surround the plurality of magnets on each said member, said intermediate rings and the said members forming a substantially continuous external cylindrical surface containing the said alternating poles.

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