Our present invention relates to a process of producing an embossing roller for the manufacture of lenticular film and more particularly of lenticular film with transverse embossings.

Reference is made to the accompanying drawings in which:

Fig. 1 shows a section through a cylinder for manufacturing an embossing roller according to this invention;

Fig. 2 shows a section through the ring shown in Fig. 1 on the line 2—2,

Fig. 3 shows a section through the cylinder which serves for the production of the embossing roller with the ring for engraving the latter,

Fig. 4 shows a section through the cylinder with the ring for engraving it parallel to the axis of the cylinder,

Fig. 5 shows a piece of the cylinder and of the ring for engraving it at right angles to the axis of the cylinder,

Fig. 6 shows a section through the cylinder,

Fig. 7 shows a section through the finished embossing roller.

Embossing tools have been made by winding a roller with wire of fine gauge and such a tool or a galvano-plastic reproduction of it has been used for embossing photographic films or supports on which they are cast. Hitherto, however, this process has been applied only to the production of longitudinally embossed films.

According to the present invention there is produced a lenticular film having transverse embossments. For this purpose a ring having on its surface suitable grooves is passed through a cylinder lined with a soft metal coating of internal diameter somewhat smaller than the external diameter of the ring, so that the grooves of the ring are engraved in the soft metal lining of the cylinder. There is then prepared a galvano-plastic reproduction of the interior of the cylinder. The grooves in the surface of the ring may be made by engraving or in some other manner. A particularly uniformly grooved surface is obtained if the ring is wound with narrow gauge wire.

The accompanying drawings illustrate the invention:

Figs. 1 and 2 show by way of example a draw tool in the form of a ring, Fig. 1 being a section parallel to the middle plane of the ring and Fig. 2 a section at right angles thereto.

R is a ring tapered at its periphery to a pointed edge S. To the inner circumference of the ring there are fixed, at equal distances apart, pins N projecting from each face of the ring; these serve to take the wire winding. The pins on one face are marked in Fig. 3 as Np and those on the other face as Nq. A thin wire of suitable cross section is wound from No over to S to Np and back over S to No, care being taken that at the edge S the windings lie close to each other. In Fig. 1 a few of the windings are shown at D and in section at D'. This wire wound ring serves as the draw tool for embossing the inner surface of the cylinder. The ring R has a core E in fixed connection with R and may form part of R. This core is provided with a rectangular opening F and thus may slide on a bar in order to guide the ring R when impressing a cylinder.

In Fig. 3 the cylinder is shown in cross section. It may be composed, for example, of halves Zt and Zs. Into the interior of the cylinder the draw tool R with its wire winding D is introduced. The inner surface of the cylinder has a thin coating of a soft metallic material, for example an electrolytically deposited lead coating. The internal diameter of the cylinder is approximately equal to the external diameter of the ring R which slightly exceeds the latter.

As shown in Fig. 4, the ring is drawn along the axis A of cylinder Z.

Fig. 5 shows a piece of the cylinder and of the ring in section at right angles to the axis of the cylinder, drawn to an enlarged scale. Z is a portion of the cylinder with its thin lead coating B. R is the draw tool having the wire wound surface D. Owing to the strong magnification the internal and external peripheries of the cylinder and the periphery of the ring are shown as straight lines. During the passage of the ring the wire winding D produces in the soft inner surface B of the cylinder Z grooves which are parallel to the axis of the cylinder.

Fig. 6 is a cross section through the cylinder after the inner surface has been grooved.

There is now produced on the inner surface of the cylinder by electro-deposition a reproduction of the surface. When a sufficient thickness of the deposited material has been obtained the two portions Zt and Zs of the cylinder are separated, if necessary after the galvano-plastic reproduction has been strengthened by a metallic insertion. There is obtained in this manner a cylinder, the cross section of which is shown in Fig. 7. Care is taken that a non-adhesive separating layer between the cylinder Z and the galvano-plastic reproduction permits the two parts
of the cylinder to be withdrawn without damaging the reproduction.

The galvano-plastic reproduction serves as the embossing cylinder. It may be internally heated in known manner and serves for embossing a suitable support on which the film is afterwards cast, so that the latter has on its under surface a reproduction of the relief of the cylinder.

What we claim is:

1. A process of producing an embossing roller for manufacturing lenticular film with embossings transverse to the longitudinal direction of the film which comprises providing a ring on its surface with grooves so that its surface corresponds with the intended surface of the lenticular film, providing a hollow cylinder on its inner surface with a coating of a soft metal so that the inner diameter of said cylinder is somewhat smaller than the outer diameter of said ring, drawing said ring through said cylinder, thus moulding the surface of said ring in said cylinder, and making a mould of said inner surface of said cylinder on a roller.

2. A process of producing an embossing roller for manufacturing lenticular film with embossings transverse to the longitudinal direction of the film which comprises providing a ring on its surface with a coil of thin wire in which each winding is adjacent to the other, providing a hollow cylinder on its inner surface with a coating of a soft metal so that the inner diameter of said cylinder is somewhat smaller than the outer diameter of said ring, drawing said ring through said cylinder, thus moulding the surface of said ring in said cylinder, and making a mould of said inner surface of said cylinder on a roller.

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