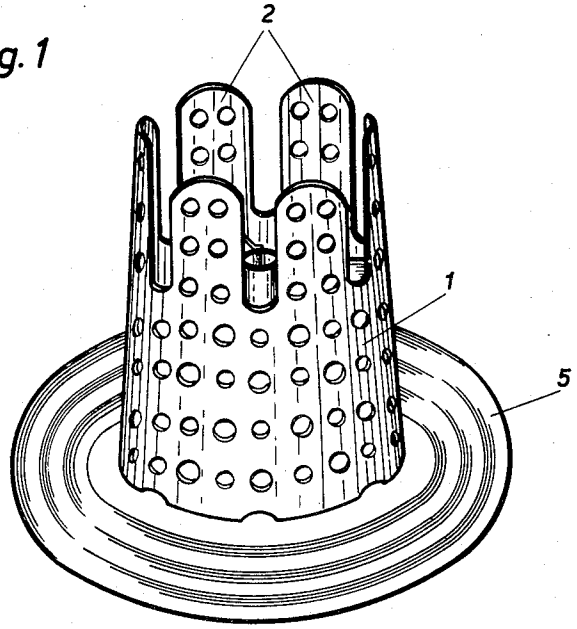
May 17, 1960 G. TIGGES 2,936,964

YARN SUPPORTING REEL

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Fig. 1



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Fig. 2

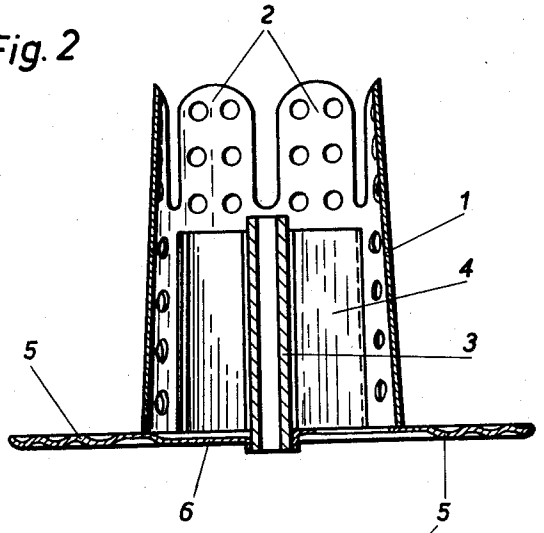
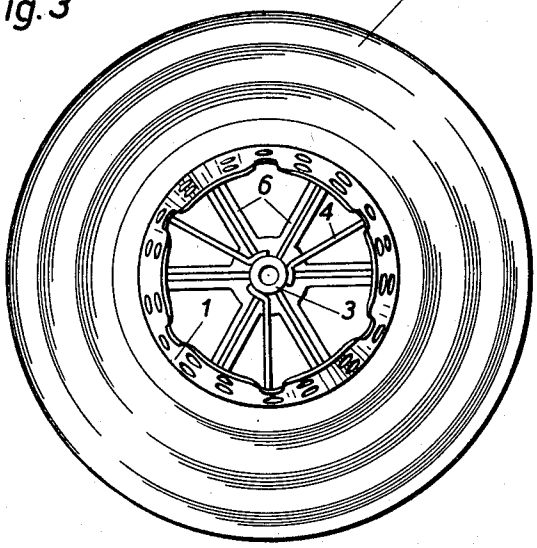


Fig. 3



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Fig. 4

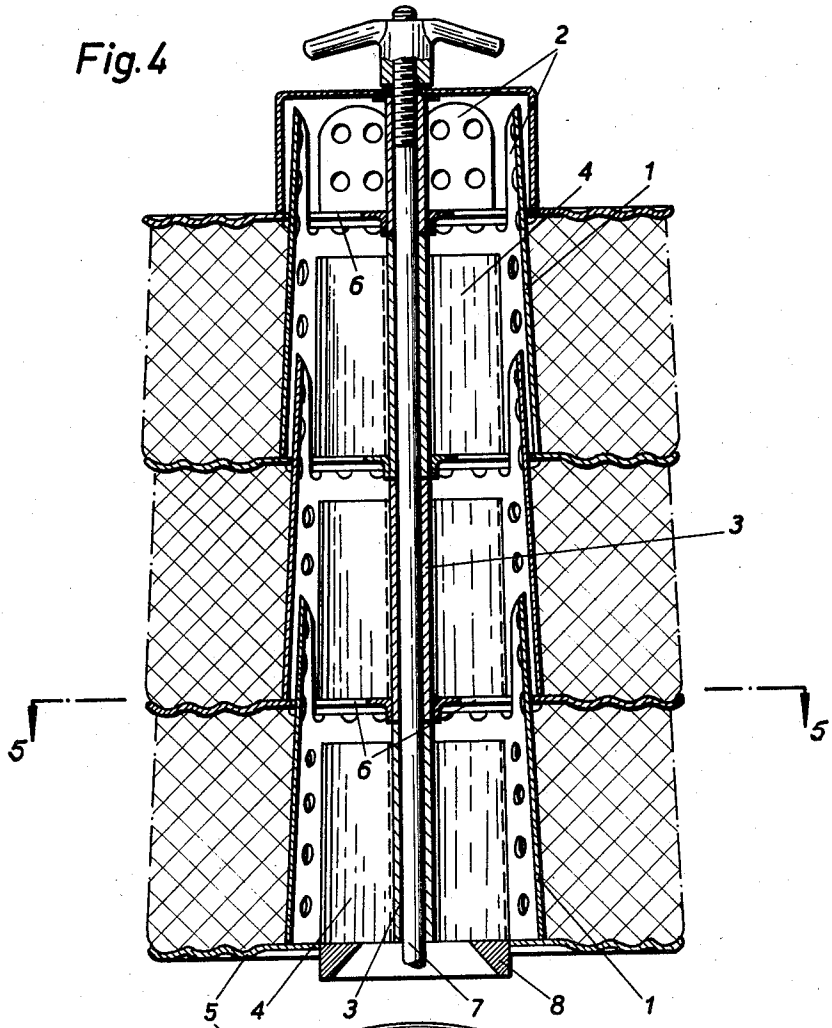
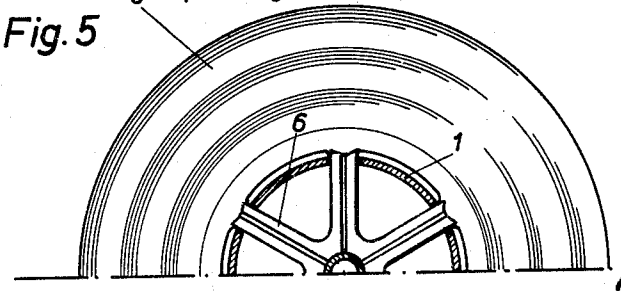


Fig. 5



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Fig. 6

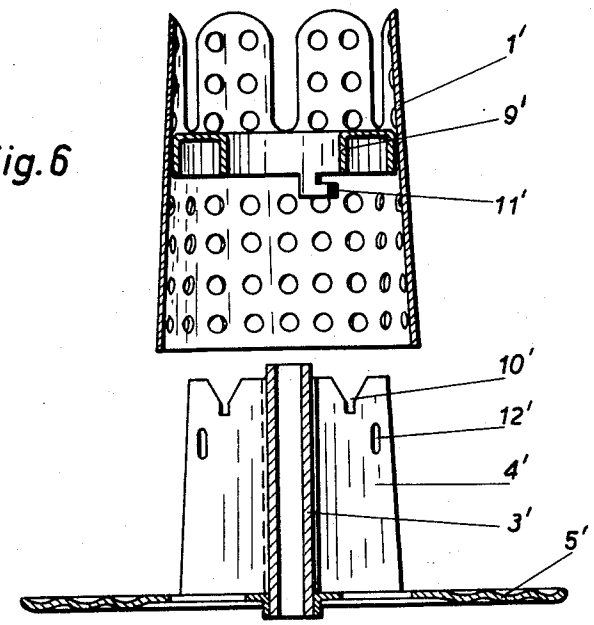
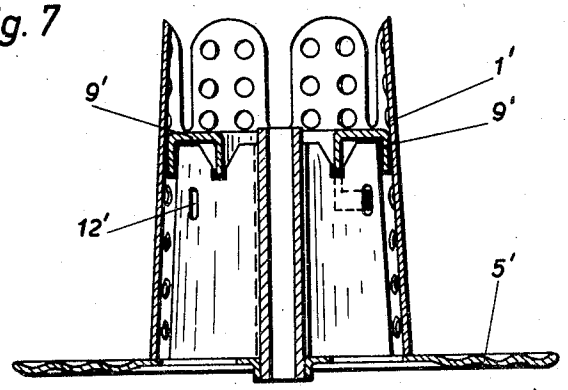


Fig. 7



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United States Patent Office 2,936,964 Patented May 17, 1960

2,936,964

YARN SUPPORTING REEL

Gerhard Tigges, Wuppertal-Cronenberg, Germany

Application February 11, 1958, Serial No. 714,541

Claims priority, application Germany February 22, 1957

5 Claims. (Cl. 242—118.1)

The present invention relates to improvements in yarn supporting reels.

More particularly, the present invention relates to a perforated frusto-conical supporting reel for laps of yarn which is to be used for wet and dry treatments of the yarn.

Yarn supporting reels, such as were known prior to the present invention, which were radially compressible and essentially consisted of the coils of a spring had the disadvantage that the shrinking of the laps of yarn, and especially of rayon, would tighten the same around the coils of the spring to such an extent that the individual layers of the yarn would penetrate between the individual coils toward the inside of the reel. The dye or other treating fluid could not then penetrate through the inner parts of the yarn laps which were engaging with the coils of the spring to the same extent as the exposed portions of the yarn.

It is an object of the present invention to provide a yarn supporting reel which overcomes the above-mentioned disadvantages of the reels which were previously known, and which comprises a rigid, perforated, frusto-conical yarn supporting reel which has an annular lap supporting plate at the lower end thereof, and the shape of which permits several of such reels to be superimposed upon each other in a telescopic relation, in accordance with the height of the lap of yarn.

It is another object of the present invention to provide the rigid, perforated yarn supporting reel with deep notches in its upper conical end portion so as to form intermediate prongs, and to support the reel at the inside thereof by means of a central spacing tube which permits the desired number of reels to be superimposed in a telescopic relation upon each other and to be removably mounted on a single spindle in an upright position one above the other. When the individual reels are thus superimposed upon each other, a plurality of supporting walls, which extend radially from the central spacing tube, interengage with the upwardly projecting prongs of the reel underneath, while the spacing tubes abut against each other and thus limit the extent to which the laps of yarn on the reels can be compressed. These spacing tubes are preferably made of a length or height which corresponds to that of the lowest lap, while for higher laps, the individual spacing tubes may be lengthened by extension rings or tubes.

It is a further object of the present invention, to provide a yarn supporting reel of the type as above described in which the outer frusto-conical sleevelike part of the reel is exchangeable for one of a different outer diameter. For this purpose, the reel is made of two separate parts, that is, an outer sleevelike part and an inner supporting part which includes the lower annular supporting plate upon which the lap is placed, the central spacing tube mounted thereon, and the radial supporting walls which, when the two parts of the reel are assembled, connect the frusto-conical sleeve part with

the spacing tube. The inner wall of the frusto-conical sleeve part is further provided with a suitable supporting member, for example, a substantially U-shaped ring which is adapted to engage into suitable recesses in the upper ends of the radial supporting walls so as to center the outer sleeve part relative to the spacing tube. It is thus possible to use the same supporting plate and spacing tube for various frusto-conical sleeve parts of different diameters.

It is yet another object of the present invention to provide a yarn supporting reel which consists in the provision of projecting portions or hooks on the last-mentioned supporting ring on the inner wall of the frusto-conical sleeve part of the reel, and suitable apertures in the radial supporting walls. A small turn of the outer sleeve relative to the inner supporting part will move the hooks into engagement with the apertures and thereby lock the two parts of the reel to each other in the axial direction thereof.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

Fig. 1 is a perspective front view of a yarn supporting reel, according to the present invention, with an annular lap supporting plate;

Fig. 2 is an axial cross section thereof;

Fig. 3 is a top plan view thereof;

Fig. 4 is an axial cross section of a plurality of superimposed yarn supporting reels, according to the present invention, with yarn laps thereon and mounted on a receiving spindle;

Fig. 5 is a cross section along the lines 5—5 in Fig. 4;

Fig. 6 is an axial cross section of a two-part yarn supporting reel, disclosing a modification of the present invention; and

Fig. 7 is the yarn supporting reel, shown in Fig. 6, in the assembled position.

Referring now to the drawings, the yarn supporting reel 1, according to the present invention, is of frusto-conical shape, and its upper end is provided with long prongs 2 which are adapted to engage into the lower end of a superimposed reel of the same type and design. Reel 1 is made of a rigid construction and provided with a large number of apertures so as to permit the treating fluid to pass from the inside of the reel through a lap of yarn thereon. A tubular member 3 at the center of the reel 1 supports the latter by means of a plurality of radial wall portions 4 and is connected by radial arms 6 to an annular lap supporting plate 5 which, in turn, supports the lower end of reel 1.

If several reels 1 with laps of yarn thereon are superimposed upon each other, as illustrated in Figs. 4 and 5, the central tubular members 3 of the individual reels 1, serving as supporting and spacing elements, may be mounted above each other on a spindle 7, while the prongs 2 at the upper end of each reel 1 engage into the lower end of the respective superimposed reel 1 and surround the radial wall portions 4 thereof. The laps of yarn on the individual reels 1 can therefore be compressed only to an extent which is limited by the length of the tubular supporting members 3, which if desired, may be lengthened by the addition of suitable extension members (not shown). For supplying the treating fluid to the inside of the reels 1, the annular plate 6 of the lowest reel is provided with a conical member 8.

Figs. 6 and 7 illustrate a modification of the invention in which the yarn supporting reel is made of two separate parts, namely, the frusto-conical outer sleeve part 1' and a supporting part which consists of the annular lap supporting plate 5', the supporting the spacing tube

3', and the radial supporting walls 4'. This permits sleeves 1' of different diameters to be applied to the same supporting plate 5' and the same spacing tube 3'. As illustrated in Fig. 6, the respective sleeve 1' is then telescoped over the upper ends of the radial walls 4' which are supported by the spacing tube 3'. For centering the sleeve 1' with respect to the spacing tube 3', the inner wall of the reel carries a ring 9' of substantially U-shaped cross section, the inner wall of which is adapted to engage into notches 10' in the upper end portion of the radial walls 4'. In order to retain the sleeve 1' also in the axial direction on the spacing tube 3' with the plate 5' thereon, the ring 9' has one or more safety hooks 11' which, after the ring 9' has been placed upon the radial walls 4', may be engaged into recesses 12' in the walls 4' by a small turn of the sleeve 1' so as to lock the two parts together. The reels, when thus assembled, may then be superimposed upon each other in the same manner as described with respect to Figs. 2 to 4.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments, but is capable of numerous modifications within the scope of the appended claims.

I claim:

1. A reel set for supporting laps of yarn for the treatment thereof comprising at least two reels disposed in superposed position and each of said reels comprising an annular supporting plate, a central spacing tube, a plurality of radial arms extending outwardly from said spacing tube and rigidly connecting said spacing tube to said supporting plate, said spacing tube extending lengthwise of said reel, and an outer rigid perforated sleeve of a frusto-conical shape supported by and rigidly secured to said supporting plate and by said spacing tube and having upwardly projecting prongs thereon adapted to engage into another superimposed reel, said outer sleeve being radially spaced apart from said central spacing tube, the length of said spacing tube determining the operative portion of said sleeve in lengthwise direction and the extent to which said lap of yarn on said outer sleeve and above said supporting plate may be compressed, when a plurality of said reels are superimposed upon each other.

2. The reel set, as set forth in claim 1, which includes a plurality of walls extending radially from said spacing tube and supporting said perforated outer sleeve, and interengaging upwardly projecting prongs of the lower of said superposed reels of the reel set.

3. The reel set, as set forth in claim 2, wherein said radial walls have recesses in their upper ends and an annular supporting member mounted on the inner wall of said perforated sleeve and is adapted to engage said recesses to center said outer sleeve.

4. The reel set, as set forth in claim 3, wherein said annular supporting member forms a ring of a substantially U-shaped cross-section with its open side facing downwardly, the inner wall of said ring engaging said recesses in the upper ends of said radial walls.

5. The reet set, as set forth in claim 3, which includes projecting portions on said annular supporting member, and said projecting portions being adapted to engage into said recesses of said radial walls.

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