

- [54] REEL
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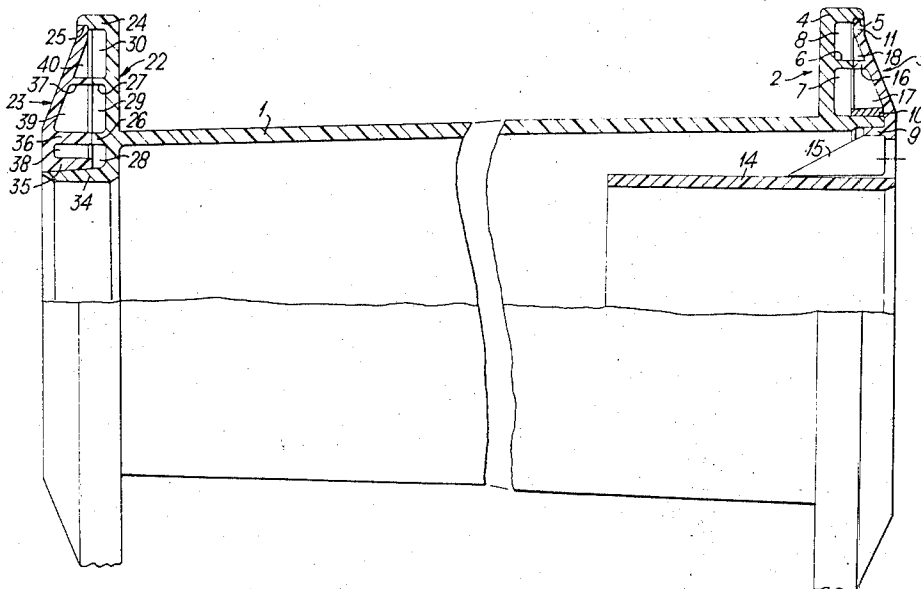
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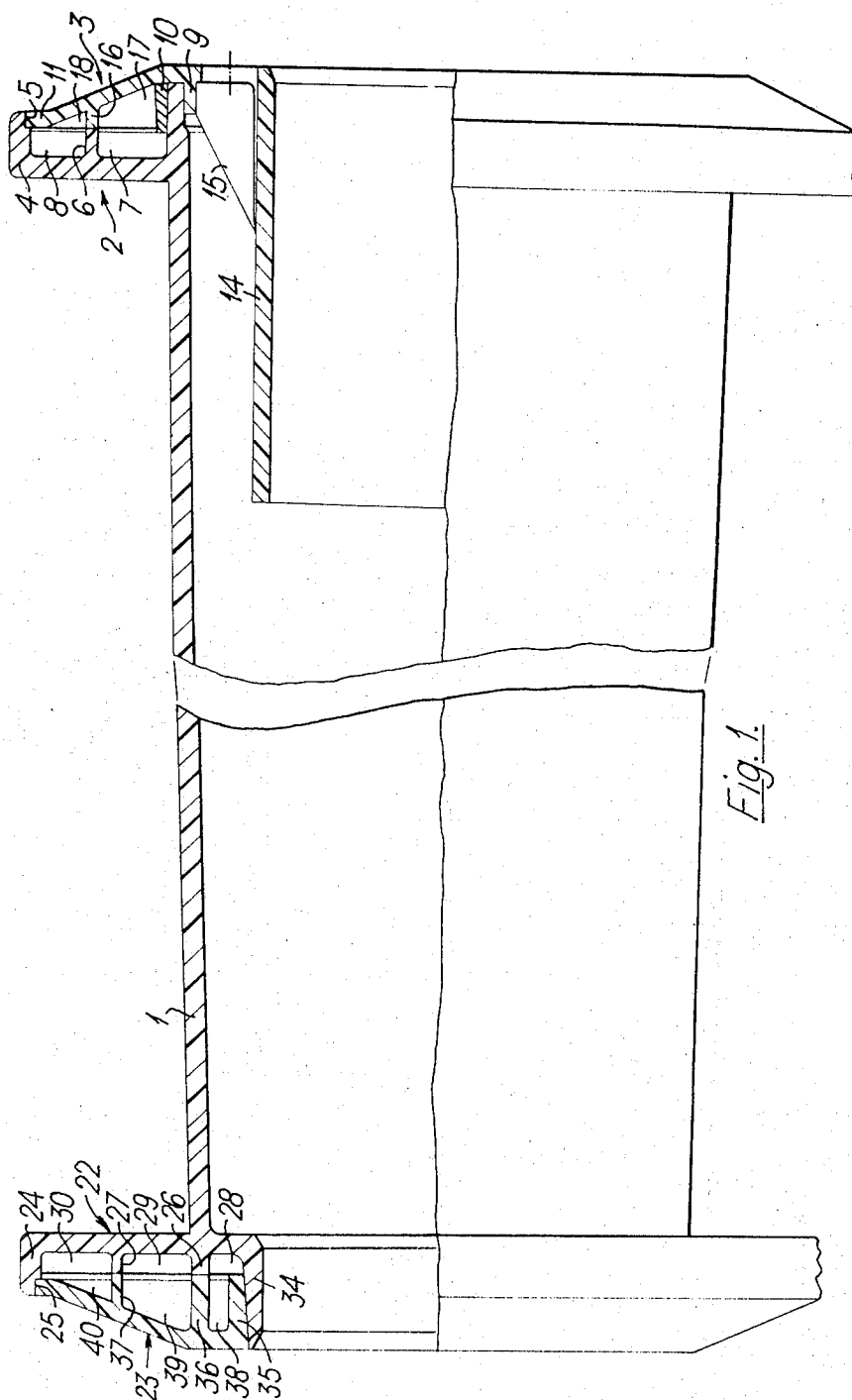
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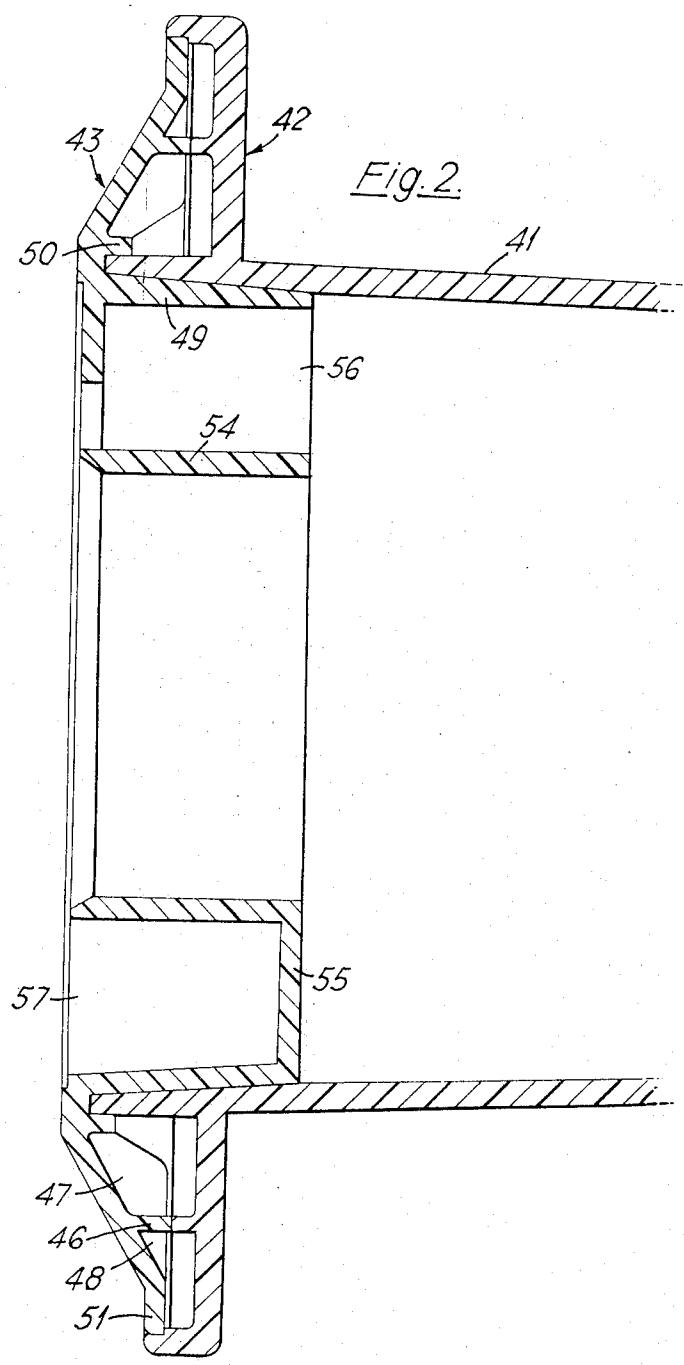
[57] ABSTRACT

In a plastics reel comprising a tubular core and two end flanges one or each of which flanges comprises two annular flange discs secured face to face, the flange discs of said flange have on their adjoining faces at least one pair of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive. Where the flanges are of circular cross-section the or each pair of ribs preferably lies between and is concentric with the radially inner and outer edges of the flange. One of the flange discs of said flange, preferably the inner, may be integral with the tubular core.

9 Claims, 2 Drawing Figures







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REEL

This invention relates to reels, bobbins, drums and like supports having end flanges, all such flanged supports hereinafter being included in the term "reel," on which can be wound wire or other elongate flexible material. The invention is particularly concerned with reels of plastics material of the kind having a pair of end flanges, one or each of which is built up of two separately formed flange discs that are secured together.

It is the object of the present invention to provide an improved plastics reel of this kind whose end flanges are capable of withstanding large forces to which they will be subjected when the reel is substantially fully wound with wire.

According to the invention the improved plastics reel has a tubular core and two end flanges one or each of which end flanges comprises two annular flange discs secured face to face, the flange discs of said flange having on their adjoining faces a pair or pairs of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive.

Preferably where the flanges are of circular cross-section at least one pair of abutting ribs of the or each flange lies between and is concentric with the radially inner and outer edges of the flange and preferably also a plurality of pairs of ribs extend radially between the pair of abutting concentric ribs and each adjoining edge of the flange, or where two or more pairs of abutting concentric ribs are present, between each edge and the neighbouring pair of abutting concentric ribs and also between adjacent pairs of abutting concentric ribs.

The tubular core and the flange discs of each flange may be separately formed and the tubular core secured to one or both of the flange discs of each flange, for instance by an adhesive, but preferably one of the flange discs of each flange is integral with the tubular core.

Where, as is preferred, the inner flange disc of each flange is integral with the tubular core the outer flange disc of at least one of the flanges preferably has on its inner face an annular groove, preferably defined at least in part by a pair of upstanding concentric walls, into which an end of the tubular core fits and is secured by an adhesive. The or each outer flange disc secured to the tubular core in this way preferably has upstanding from its radially inner edge a peripherally continuous wall which extends into the bore of the tubular core and serves as a bush for supporting the reel on a shaft or other elongate support. With a view to locating accurately the supporting bush of the reel the radially inner wall of the pair of walls defining the annular groove and the wall serving as the supporting bush may be of approximately the same length and, at their inner ends, integral with a radially extending annular wall. This radially extending annular wall and the part of the flange disc between the roots of the radially inner wall of the pair of walls defining the groove and of the supporting bush may each have a plurality of circumferentially spaced holes, the holes in the flange disc preferably being circumferentially staggered in relation to the holes in the radially extending annular wall.

One or each inner flange disc integral with the tubular core may extend radially inwardly of the core and have upstanding from its radially inner edge a peripherally continuous wall which serves as a bush for support-

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ing the reel on a shaft or other elongate support. In this case the adjoining outer flange disc preferably has a peripherally continuous wall which upstands from its radially inner edge and fits over and is secured by an adhesive to the radially outer surface of the bush of the inner flange disc.

The radially outer edge of each of the outer flange discs preferably engages and is secured by an adhesive in the recessed end face of a rim upstanding from the radially outer edge of the adjoining inner flange disc.

The tubular core may have an external diameter that decreases smoothly from one end flange to the other.

Preferably the component parts of the plastics reel are moulded bodies of high impact polystyrene. Other plastics materials of which the reel may be made include polycarbonates, styrene acrylonitrile, acrylonitrile butadiene styrene, acetal resins, polyamide resins and polyphenylene oxide resins, with or without additives. Preferred adhesives are epoxy resins and solvent-based adhesives.

The invention will be further illustrated by a description, by way of example, of a preferred plastics reel and of an alternative form of end flange of a plastics reel with reference to the accompanying drawings, in which:

FIG. 1 is a side view of the preferred form of reel shown partly in section and partly in elevation, and FIG. 2 is a sectional side view of the alternative form of end flange.

Referring to FIG. 1 the reel comprises a tubular core 1 of circular cross-section whose external diameter decreases smoothly throughout its length and which has at one end a flange of circular cross-section built up of an inner flange disc 2 and an outer flange disc 3 and at its other end a flange of circular cross-section built up of an inner flange disc 22 and an outer flange disc 23. The reel has an overall length of 400 mm; one flange has a diameter of 250 mm and the other flange has a diameter of 236 mm; and the external diameter of the core decreases smoothly from 160 mm at one end of the core to 140 mm at the other end of the core.

The inner flange disc 2 is integral with and spaced a short distance from one end of the tubular core 1 and has upstanding from its radially outer edge a rim 4 whose end face is recessed at 5. Upstanding from the flange disc 2 between and concentric with the core 1 and the rim 4 is a circular rib 6 and a plurality of circumferentially spaced radial ribs 7 and 8 extend, respectively between the core and the rib 6 and between the rib 6 and the rim. The outer flange disc 3 is approximately saucer-shaped and has upstanding between its radially inner and outer edges a pair of concentric walls 9 and 10 defining an annular groove into which the end of the tubular core 1 fits and is secured by adhesive. A radially outwardly extending flange 11 at the outer edge of the flange disc 3 engages and is secured by an adhesive in the recess 5 in the rim 4. Upstanding from the flange disc 3 between and concentric with the walls 9 and 10 and the flange 11 is a circular rib 16 which abuts and is secured by an adhesive to the rib 6 on the inner flange disc 2 and extending radially between the wall 10 and the rib 16 and between the rib 16 and the flange 11 are a plurality of circumferentially spaced ribs 17 and 18 which correspond with but are spaced from the ribs 7 and 8 of the flange disc 2. A wall 14 upstanding from the radially inner edge of the outer

flange disc 3 and extending into the bore of the core 1 serves as a bush for the reel, the wall being strengthened by radial ribs 15 extending between the bush and the wall 9.

The inner flange disc 22 is integral with the other end of the tubular core 1 and extends a short distance radially inwardly of the core. Upstanding from the radially inner edge of the flange disc 22 is a wall 34 which has an internal diameter equal to that of the bush 14 and which serves as a bush for the reel and upstanding from the radially outer edge of the disc is a rim 24 whose end face is recessed at 25. Two circular ribs 26 and 27 upstand from the flange disc 22 between and concentric with the bush 34 and rim 24 and a plurality of circumferentially spaced ribs 28, 29 and 30, respectively, extend radially between the bush 34 and the rib 26, between the ribs 26 and 27 and between the rib 27 and the rim 24. The outer flange disc 23 is approximately saucer-shaped and has upstanding from its radially inner edge a rim 35 which engages over and is secured by an adhesive to the bush 34. The radially outer edge of the flange disc 23 has a radially extending flange 31 which engages and is secured by an adhesive in the recess 25 in the end face of the rim 24. The flange disc 23 has two upstanding circular ribs 36 and 37 between and concentric with the bush 34 and flange 31 and these ribs abut and are secured by an adhesive to the ribs 26 and 27 on the disc 22. Extending radially between the rim 35 and the rib 36, between the ribs 36 and 37 and between the rib 37 and the flange 31 are circumferentially spaced ribs 38, 39 and 40 which correspond with but are spaced from the ribs 28, 29 and 30 of the flange disc 22.

The alternative form of end flange of a reel shown in FIG. 2 is of circular cross-section and is built up of an inner flange disc 42 and an outer flange disc 43. The inner flange disc 42 is integral with the tubular core 41 of the reel and is of similar construction to the inner flange disc 2 of the reel shown in FIG. 1 except that at the end of the tubular core the internal diameter of the core increases smoothly toward its free end.

The outer flange disc 43 is approximately saucer-shaped and has upstanding between its radially inner and outer edges a pair of concentric walls 49 and 50 defining an annular groove into which the end of the tubular core 41 fits and is secured by an adhesive. The wall 49 has an external diameter which decreases smoothly towards its free end and is such that the wall engages in the end of the tubular core 41. A wall 54 upstanding from the radially inner edge of the outer flange disc 43 extends into the bore of the core 1 and is approximately the same length as the wall 49, the wall 54 serving as a bush for the reel. At their inner ends the walls 49 and 54 are integral with a radially extending annular wall 55 in which are four holes 56 circumferentially spaced at regular intervals, the holes each approximating in shape to a sector of an annulus. In the parts of the outer flange disc 43 between the roots of the walls 49 and 54 are four uniformly circumferentially spaced holes 57 of similar shape to the holes 56, the holes 57 being circumferentially staggered in relation to the holes 56. A radially outwardly extending flange 51 at the outer edge of the flange disc 43 engages and is secured by an adhesive in a recess in the outer rim of the inner flange disc 42. Upstanding from the flange disc 43 between and concentric with the walls 49, 50 and 54 and the flange 51 is a circular rib

46 which abuts and is secured by an adhesive to a circular rib on the inner flange disc 42 and extending radially between the wall 50 and the rib 46 and between the rib 46 and the flange 51 are a plurality of circumferentially spaced radial ribs 47 and 48 which correspond with but are spaced from circumferentially spaced radially extending ribs on the inner flange 42.

The tubular core and integral inner flange discs and the outer flange discs shown in FIGS. 1 and 2 are each a moulded body of high impact polystyrene.

The plastics reel of the present invention has the important moving advantage that its end flanges are capable of withstanding both the large forces to which they will be subjected when the reel is substantially fully wound with wire and the impact and other treatment to which a reel is normally subjected whilst it is in use in a factory.

What I claim as my invention is:

1. A plastics reel comprising a tubular core and two end flanges of circular cross-section at least one of which flanges comprises two annular flange discs secured face to face, wherein one of the flange discs is integral with the tubular core and the flange discs of said flange have on their adjoining faces at least one pair of ribs lying between and concentric with the radially inner and outer edges of the flange, the end surfaces of said concentric ribs abutting and being joined by an adhesive, and a plurality of pairs of ribs which extend radially between the pair of abutting concentric ribs and each adjoining edge of the flange or, where at least two pairs of abutting concentric ribs are present, between each edge and the neighbouring pair of abutting concentric ribs and also between adjacent pairs of abutting concentric ribs, the radially extending ribs on one end flange disc corresponding with the radially extending ribs of the other reel flange disc.

2. A plastics reel comprising a tubular core and two end flanges at least one of which flanges comprises two annular flange discs secured face to face, wherein the inner flange disc of each flange is integral with the tubular core, the flange discs of at least one of said flanges have on their adjoining faces at least one pair of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive, and the outer flange disc of at least one of said flanges has on its inner face an annular groove into which an end of the tubular core fits and is secured by an adhesive.

3. A plastics reel as claimed in claim 2, wherein the annular groove is defined at least in part by a pair of upstanding walls.

4. A plastics reel comprising a tubular core and two end flanges at least one of which flanges comprises two annular flange discs secured face to face, wherein the inner flange disc of said flange is integral with the tubular core, the outer flange disc has upstanding from its radially inner edge a peripherally continuous wall which extends into the bore of the tubular core and serves as a bush for supporting the reel on an elongate support, and the flange discs of said flange have on their adjoining faces at least one pair of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive.

5. A plastics reel comprising a tubular core and two end flanges at least one of which flanges comprises two annular flange discs secured face to face, wherein the flange discs of said flange have on their adjoining faces

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at least one pair of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive and the radially outer edge of the outer flange disc of said flange engages and is secured by an adhesive in the recessed end face of a rim upstanding from the radially outer edge of the adjoining inner flange disc.

6. A plastics reel comprising a tubular core and two end flanges at least one of which flanges comprises two annular flange discs secured face to face, wherein one of the flange discs of said flange is integral with the tubular core and the flange discs of said flange have on their adjoining faces at least one pair of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive, said inner flange disc of each flange being integral with the tubular core, the outer flange disc of at least one of the flanges having on its inner face an annular groove into which an end of the tubular core fits and is secured by an adhesive, said annular groove defined at least in part by a pair of upstanding walls and a peripherally continuous wall upstanding from the radially inner edge of the outer flange disc and extending into the bore of the tubular core to serve as a bush for supporting the reel on an elongate support, the radially inner wall of the said pair of walls and said peripherally continuous wall being of approximately the same length and, at their inner ends,

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integral with a radially extending annular wall.

7. A plastics reel as claimed in claim 6, wherein radially extending annular wall and the part of the flange disc between the roots of the radially inner wall of the pair of walls defining the groove and of the peripherally continuous wall each have a plurality of circumferentially spaced holes.

8. A plastics reel comprising a tubular core and two end flanges at least one of which flanges comprises two annular flange discs secured face to face, wherein one of the flange discs of said flange is integral with the tubular core and the flange discs of said flange have on their adjoining faces at least one pair of ribs of substantially the same configuration whose end surfaces abut and are joined by an adhesive, at least one inner flange disc extending radially inwardly of the core and having upstanding from its radially inner edge a peripherally continuous wall which serves as a bush for supporting the reel on an elongate support.

9. A plastics reel as claimed in claim 8, wherein the outer flange disc adjoining said inner flange disc has a peripherally continuous wall which upstands from its radially inner edge and fits over and is secured by an adhesive to the radially outer surface of the bush of the inner flange disc.

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