United States Patent

Feichtinger

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[54] **SPOOL**

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[52] **U.S. Cl.**.....**242/71.8,** 242/118.4

[51] **Int. Cl.**.....**B65h 75/18**

[58] **Field of Search**.....242/71.8, 71.8 A, 118.4, 118.8, 242/77.3; 197/175

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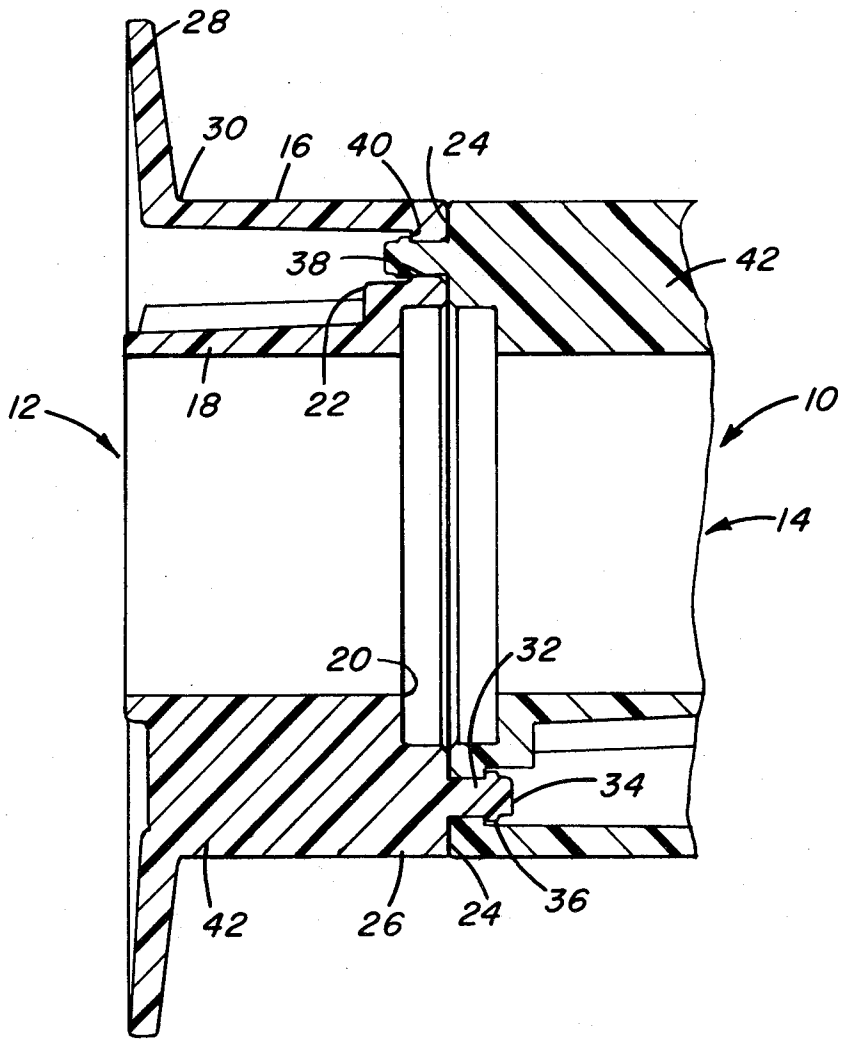
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[57] **ABSTRACT**

A spool formed by joining two substantially identical halves. Each spool half is provided with projections which are inserted into openings in the mating half upon assembly of the spool.

6 Claims, 3 Drawing Figures



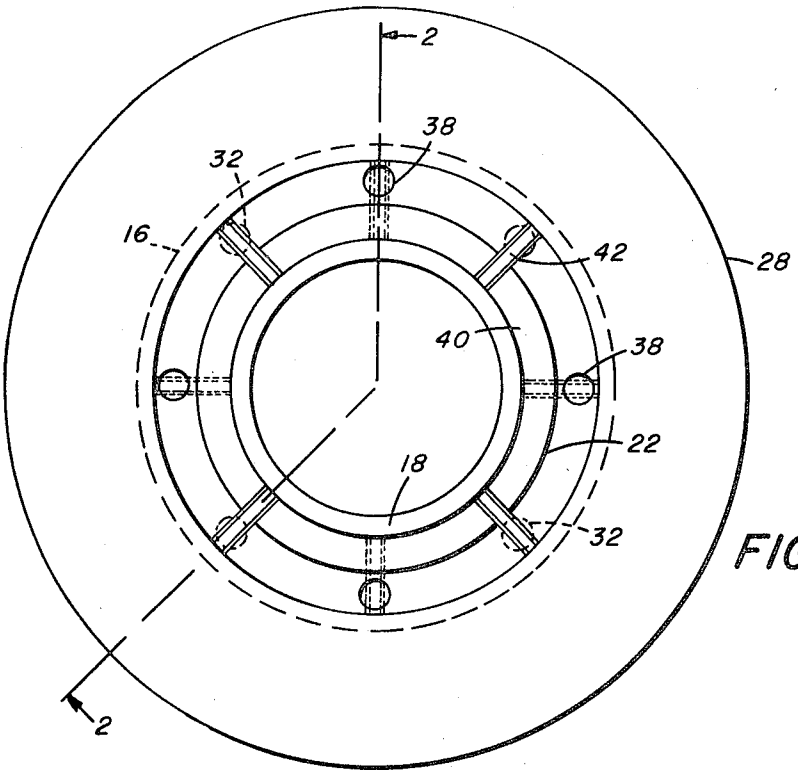


FIG. 1

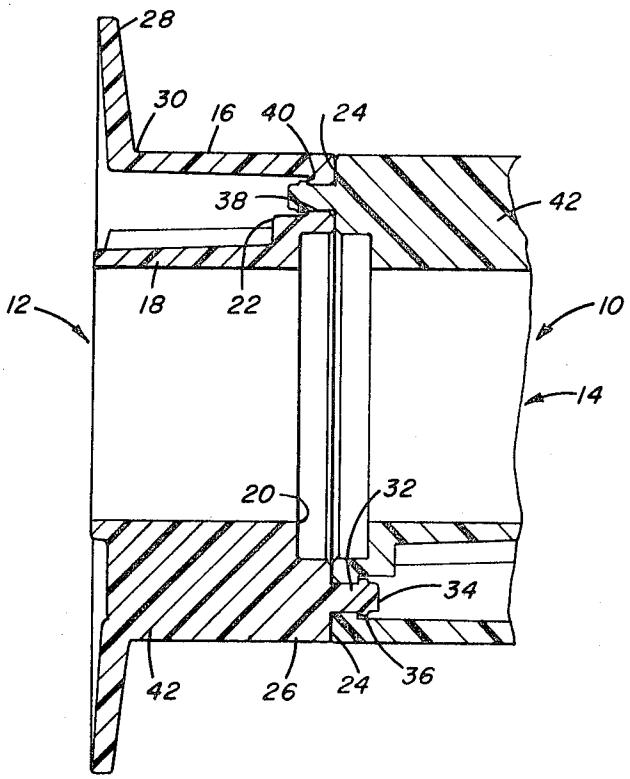


FIG. 2

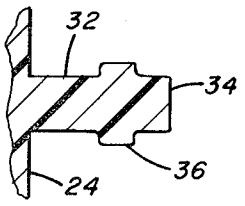


FIG. 3

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SPOOL

This invention relates generally to spools and more particularly to spools about which film or the like may be wound.

BACKGROUND OF THE INVENTION

In the processing of photographic film, the film is wound around several rollers or spools, some of which are immersed in the processing fluid. Heretofore, these spools have been constructed of two substantially identical halves which are glued or otherwise bonded together. Difficulties have been experienced in the utilization of such spools because the processing fluids may dissolve the glue or otherwise attack the bond thereby causing the spools to come apart with resultant damage to the film being processed.

Various means have been proposed by which these difficulties may be overcome, however, they have not been entirely satisfactory. For example, screws to hold the halves together have been suggested. The screws may loosen permitting the spool halves to open up or come apart with resultant damage to the film. In addition more effort is required in assembling the spools, hence, a higher cost. In addition these prior art spools have not been readily replaceable thereby providing for a rapid change in sizes or rapid replacement of a damaged spool.

SUMMARY OF THE INVENTION

It is therefore one of the objects of the present invention to provide a spool that will meet all of the functional requirements for processing of film and which will be simple and inexpensive. It is another object of this invention to provide a spool composed of two substantially identical spool halves of plastic material which can be simply interfitted in the final assembly to produce the finished spool. Another object of this invention is to provide a spool which may be constructed from identical spool halves thereby requiring only a single die for the manufacture of the spool halves. Another object of this invention is to provide a spool that may be mechanically interconnected and does not require adhesives or welding to maintain the spool in assembled position.

These and other objects and advantages of this invention will become apparent from a reading of the following detailed description and are accomplished by providing a spool of two substantially identical spool halves. Each of the spool halves is provided with a barrel portion, and a radial flange at one end of the barrel portion. A plurality of pins or male end members extend from the barrel portion in a direction parallel to the axis of the spool half. An opening in the barrel portion is interposed between adjacent male end members. Each of the male end members may be provided with an annular rib near its end which rib is adapted to be inserted into the opening of the associated spool half and to hold the two halves together.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a spool of this invention.

FIG. 2 is a partial cross-sectional view along the line 2—2 of FIG. 1.

FIG. 3 is a view to an enlarged scale of a portion of the spool half of this invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawing, the spool **10** is composed of two substantially identical spool halves **12** and **14**. The two halves preferably are identical thereby necessitating the use of only a single die in the manufacture of the spool halves which preferably are formed from a thermoplastic, such as, polypropylene, polyethylene, cellulose acetate butyrate, nylon, polystyrene, or the like. Since the spool halves in the drawing are identical, only spool half **12** will be discussed in detail.

The spool half **12** includes a barrel portion **16** of cylindrical configuration and a core member **18** located within and spaced from the barrel portion **16**. The core member **18** is also cylindrical and terminates at one end **20** in a shoulder portion **22** which shoulder portion **22** is joined to a web portion **24**. The web portion **24** joins the shoulder portion **22** of the core member **18** to the end **26** of the barrel portion **16**. A flange **28** extending radially outwardly from the other end **30** of the barrel position **16** serves to prevent any film wrapped on the spool **10** from sliding off the barrel portion **16**.

In order to hold the two spool halves **12** and **14** together, a plurality of male end members, or pins **32** project from the web portion **24** in a direction parallel to the longitudinal axis of the spool half **12**. These male end members **32** are arranged around the circumference of a circle (FIG. 1) and are integral with the web portion **24** (FIG. 2). In the preferred embodiment, four male end members or pins **32** are provided and they are spaced at 90° intervals around the circumference of the circle. Each male end member **32** is provided near its end **34** with an annular rib **36** which rib extends radially outwardly from the male end member **32** a short distance.

A plurality of holes **38** equal in number to the male end members **32** are arranged around the circumference of the circle on which the male end members are positioned. The holes **38** are centered between adjacent members **32** and thus are 45° from the centerline of each adjacent male end member **32**. The holes **38** are of sufficient size to permit the ribs **36** of the mating spool half **14** to be forced through the holes when the male end members **32** are inserted into the holes, but insufficient to allow the ribs to be readily withdrawn. The holes extend completely through the web portion **24** which web portion is of the thickness equal to or, preferably, slightly less than the distance between the web portion and the rib **36** in order that upon insertion of the members **32** into the holes **38** the rib will pass completely through the hole and be retained against the underside **40** of the web portion **24** of the spool half **14** in snap-fit relationship. The rigidity of the spool halves may be improved by providing a plurality of webs **42** extending between the barrel portion **16** and the core member **18**.

The ribs **36** may, in some instances, be eliminated. In such cases the pins **32** and the holes **38** must be dimensioned to provide a very tight fit. If a permanent connection is desired and after the pins have been inserted, heat and pressure may be applied to the ends of some but not necessarily all of the pins to deform the same to hold the spool halves together.

While the above-described spool has been provided with an equal number of male end members **32** and holes **38**, it should be understood that, if for reasons of manufacture or otherwise, more holes **38** are formed in the web portion, this device will function equally well.

In the event that a wider spool is desired, a hollow cylindrical sleeve member may be provided. Its ends could be identical to the web portion of the spool halves. The ends could also be provided with openings to receive the male end members.

This invention has been described with reference to film-processing spools. It should be understood that it has other applications such as in the temporary to permanent storage of film or other elongated and flexible items such as wire, tape or the like.

The invention has been described in detail with particular reference to preferred embodiments thereof but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

I claim:

1. A spool comprising two substantially identical spool halves, each of said halves having a barrel portion, a cylindrical core member, a web portion connecting said core member and said barrel portion, a radial flange at one end of said barrel portion, a plurality of male end members extending outwardly from said web portion in a direction parallel to the axis of said spool half and being spaced from each other, a plurality of openings in said web portion adapted to be aligned with the male end members of the mating spool half, an annular rib on

each of said male end members adapted to be inserted into its associated opening upon assembly of said halves thereby holding said spool halves together.

2. A spool according to claim 1 wherein said male end members and said openings are arranged alternatively around the circumference of a circle on said web portion.

3. A spool according to claim 1 wherein said web portion is of a thickness equal to or slightly less than the distance between the annular rib on said male end members and the web portion.

4. A spool according to claim 1 wherein said male end members and said openings are each four in number.

5. A spool according to claim 2 wherein said male end members and said openings are located an equal distance from each other.

6. A spool comprising two substantially identical spool halves, each of said halves having a barrel portion, a radial flange portion at one end of said barrel portion, a plurality of male end members on the other end of said barrel portion, said male end members extending outwardly in a direction parallel to the axis of said barrel portion, an annular rib on at least some of said male end members, a plurality of openings in said other end of said barrel portion at least equal in number to the number of said male end members, said openings being adapted to receive and retain in snap-fit relationship the male end members and ribs of the mating spool half.

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