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INFLATABLE TEXTILE WINDER

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Fig. 1

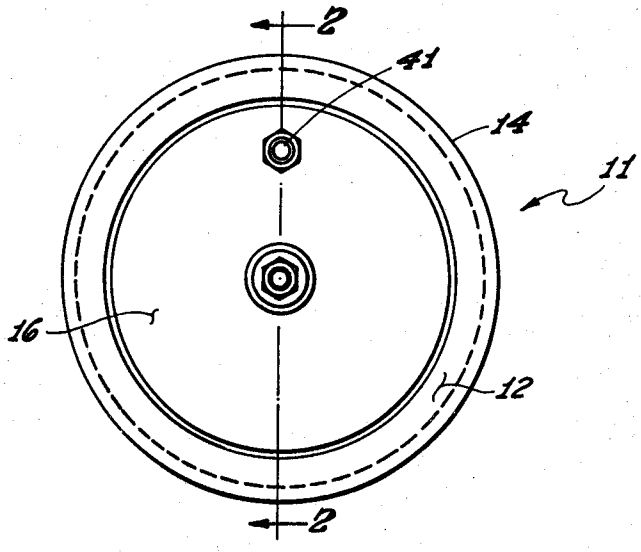
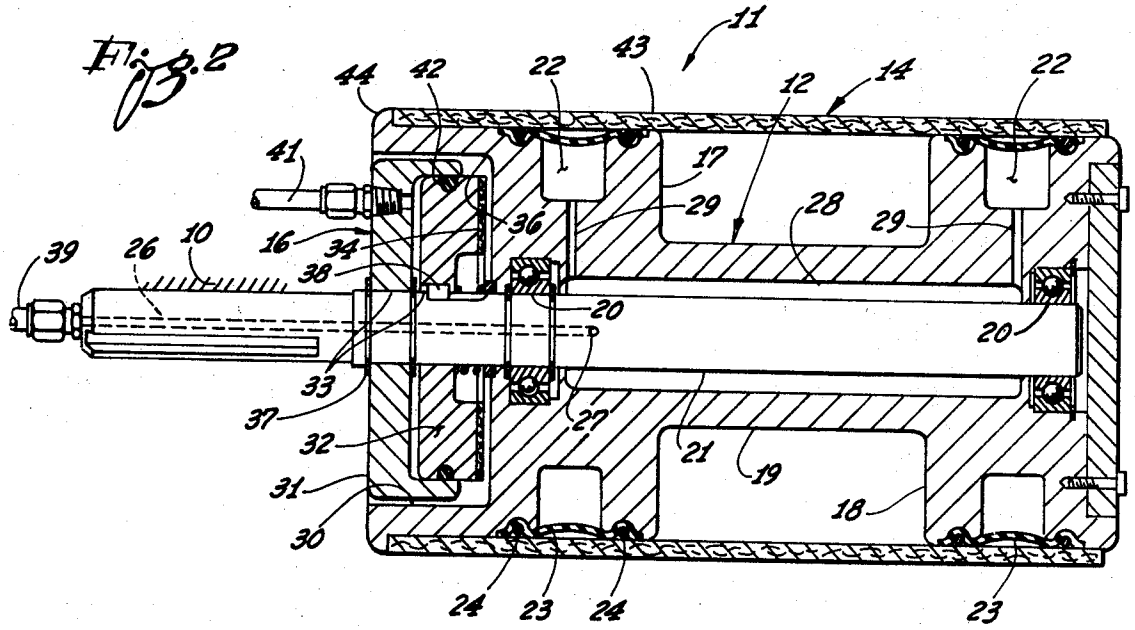


Fig. 2



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INFLATABLE TEXTILE WINDER

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U.S. Cl. 242—46.4 4 Claims

ABSTRACT OF THE DISCLOSURE

An expandable self-contained chuck member facilitating the winding of yarns, filaments etc. on receiving members and including means precluding rotation of the latter before, after and during an initial or final winding operation.

This invention relates to an expanding chuck assembly functioning to securely retain a receiving member on which yarns, filaments etc. are wound. The chuck assembly as disclosed herein comprises a spool-like member having wide end portions of cylindrical configuration and which embodies all components of the expansion means. Constructed in this manner, and as explained as the disclosure progresses, it will be understood that the subject chuck assembly is self-contained, that is all operating components of the assembly are located within the assembly. The expansion assembly, as disclosed herein is utilized with "yarn takeup apparatus" as shown in U.S. Pat. No. 3,355,116.

The chuck assembly as disclosed herein includes a braking facility which when actuated precludes rotation of the chuck assembly and the yarn receiving member with respect to a shaft on which the chuck assembly is supported. The brake means becomes effective at the conclusion of a winding operation and functions to arrest rotation of the chuck assembly and receiving member during the initial or final phases of a winding operation and, therefore, lessens the possibility of filaments becoming tangled or loosening on the receiving member.

It is an object of the present invention to provide an expansion type chuck, adapted to retain a receiving member thereon and on which a continuous filament or the like is to be wound, which is self-contained.

Another object is to provide an expansion type chuck including brake means functioning to preclude loosening and tangling of a filament during the initial or terminal phases of a winding operation.

FIG. 1 is an end view of the expanding chuck as disclosed herein.

FIG. 2 is a sectional view of FIG. 1 taken along the line 2—2 of the latter figure.

Referring to the drawing, a preferred embodiment of the expanding chuck assembly **11**, as disclosed herein, is shown in the figures. Major components of the assembly **11** include a mandrel assembly, a receiving member and a brake assembly **12**, **14** and **16**, respectively.

The mandrel assembly **12**, generally of spool-like configuration, includes end portions **17** and **18** and a body portion **19**. The assembly **12** is mounted for rotation on a shaft **21**, the latter having a fixed relation with respect to stationary structure **10** of take-up apparatus (not shown) and with which the shaft **21** is associated. Rotation of the assembly **12**, on the shaft **21**, is provided by a pair of roller bearings **20** mounted in the portions **17** and **18**.

Each of the end portions **17** and **18** has an annular recess **22** formed therein which opens on the peripheral surface of the mandrel assembly **12**. The recesses **22** are rendered fluid tight by elastic bands **23** which are held in place by O-rings **24** surrounding the assembly **12**. By

referring to FIG. 2 it will be seen that the bands **23** and O-rings **24**, especially when the recesses **22** are not pressurized, are positioned and substantially define a continuation of the peripheral surface of the assembly **12**.

Referring further to FIG. 2 it will be seen that the left-hand end of the shaft **21** has a bore **26** formed therein. The bore **26** provides a passageway for pressurized fluid which in turn communicates with the recesses **22** through bores **27**, enlarged central portion **28** of the assembly **12** and bores **29**.

The brake means **16** is mounted in the portion **17**, substantially as shown in FIG. 2, and functions to arrest rotational movement of the assembly **12** when actuated. The means **16** includes a housing portion **31** and a plunger or brake portion **32**. The portions **31** and **32** are of cylindrical configuration and have a concentric relation with respect to each other and with respect to the portion **17**. Central apertures **33** are provided in the portions **31** and **32** enabling the latter to be mounted on the shaft **21**. The portion **32** of the brake means **16** is received in a central recess **30** which is circular in cross-section. The annular face of the portion **32** has a juxtaposed relation with respect to a circular face **36** of the mandrel assembly **12** and carries a fabric lining **34**. The lining **34** functioning as a braking surface in a manner presently explained. The relative longitudinal position of the portion **31** with respect to the shaft **21** is maintained by means of retaining rings **37** while sliding movement is made possible by a key **38**. Pressurized fluid is transmitted to the brake means **16** via a line **41**. The plunger **32** of the brake assembly **16** is rendered fluid tight with respect to the housing portion **31** by means of an O-ring **42** positioned between mating surfaces thereof.

Construction of the assembly **11** is completed by a sleeve **43** of hollow cylindrical configuration received in a surrounding relation with respect to mandrel **12** and having an abutting relation with respect to an annular flange **44** provided on the portion **17** of the assembly **12**. Accordingly it will be seen that rotation of the mandrel assembly **12** may be completely arrested while the member **43** is positioned on or removed from the assembly **12**. This is made possible by actuating the brake means **16**, the manner in which the brake means functions is believed apparent and further explanation in this respect is not believed necessary. It should be pointed out, however, that pressurized fluid entering the recesses **22** results in expanding the bands **23** causing them to contact the inner surface of the sleeve member **43** precluding relative movement thereof with respect to the assembly **12**. Rotation or free-wheeling of the assembly **12** is not only precluded, as a result of the above operation, but rotational movement of the sleeve member **43** is arrested during the time a filament or strand of yarn is secured to the member **43**.

The assembly **11** is rotated on the shaft **21** by means of a drive roll (not shown), this movement being imparted to the assembly **11** by friction in a conventional manner by the aforementioned drive roll. At the end of a winding operation the means **16** is activated, thus rotation of the assembly **11** is precluded while the end of the filament etc. is secured to the member **43** and the member removed from the assembly **12**. Thus unwinding of the sleeve member **43** is precluded, due to accidental rotation or free-wheeling of the assembly **11**, on the shaft **21**. Fluid pressure in the recesses **22** is then released making possible the removable of the sleeve-member **43**.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of putting the invention into

effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

What is claimed is:

1. In apparatus for effecting a winding operation in which a continuous filament is wound on a receiving member, comprising:

(a) a shaft adapted to be mounted in apparatus for effecting a winding operation and having a fixed relation with respect to fixed members of the apparatus;

(b) a spool-like mandrel assembly having end portions and a body portion extending therebetween;

(c) a recess of cylindrical configuration being defined by one of said end portions;

(d) and brake means mounted in said recess functioning to arrest rotation of said mandrel assembly on said shaft at such time as said brake means is activated.

2. In apparatus as set forth in claim 1:

(a) in which said brake means is actuated by fluid pressure;

(b) said brake means including a housing and a plunger member both having a concentric relation with said shaft;

(c) and said brake means being positioned entirely within said recess.

3. In apparatus for effecting a winding operation in which a continuous filament is wound on a receiving member, comprising:

(a) a shaft adapted to be mounted in apparatus for effecting a winding operation and having a fixed relation with respect to fixed members of the apparatus;

(b) a mandrel assembly generally of cylindrical configuration and including end portions and a body portion extending therebetween;

(c) an annular recess formed in each of said end portions and opening on the periphery of said mandrel assembly;

(d) a sleeve-like elastic member positioned around said mandrel assembly and spanning each of said recesses rendering the recesses fluid tight;

(e) a source of pressurized fluid;

(f) passageways extending between said fluid source and recesses and providing fluid comunication therebetween;

(g) and a hollow member of cylindrical configuration positioned on the periphery of said mandrel whereby said sleeve member is fixedly secured on said mandrel assembly at such time as said pressurized fluid is ported to said recesses.

4. In apparatus as set forth in claim 3:

(a) a second recess in one of said end portions having a concentric relation with respect to said shaft;

(b) and brake means mounted in said concentric recess and functioning to arrest rotation of said mandrel on said shaft at such time as said brake means is activated.

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