Oct. 12, 1954 K. P. SWANSON ET AL 2,691,402

COT ASSEMBLING APPARATUS

Filed Dec. 18, 1951

2 Sheets-Sheet 1

Fig. 1

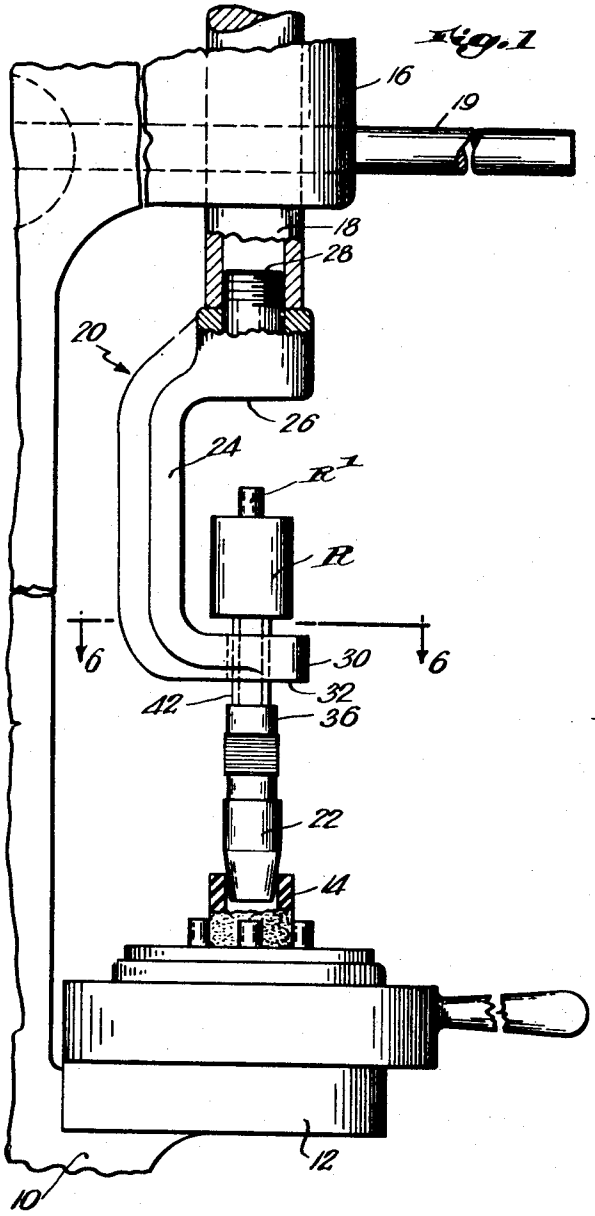


Fig. 2

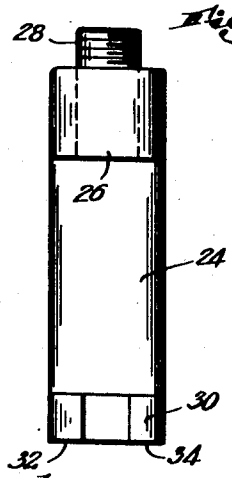


Fig. 3

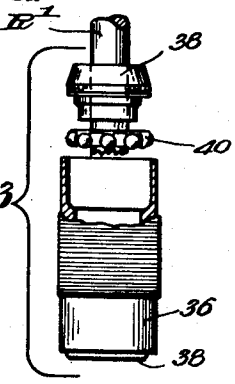


Fig. 4

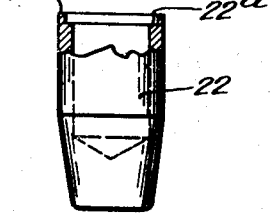
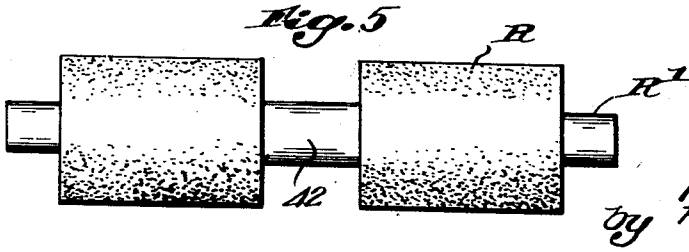


Fig. 5



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2 Sheets-Sheet 2

Fig. 6

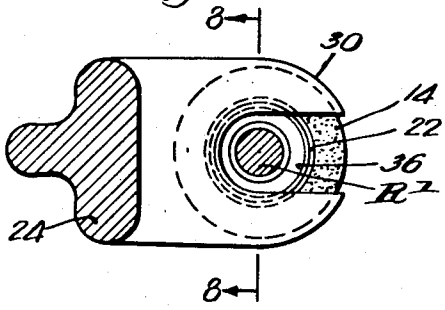


Fig. 7

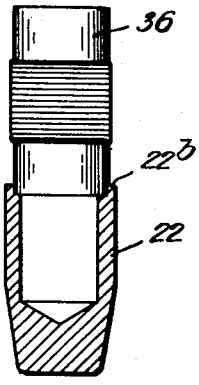


Fig. 8

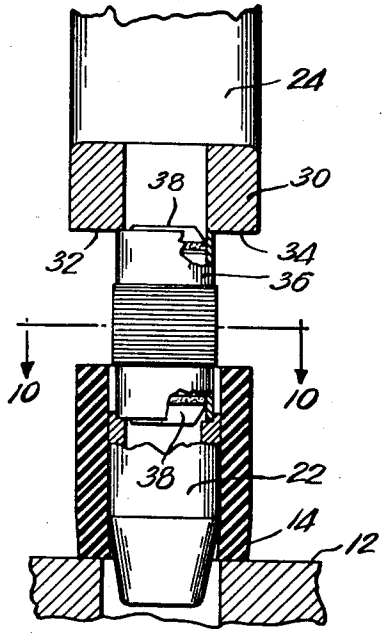


Fig. 9

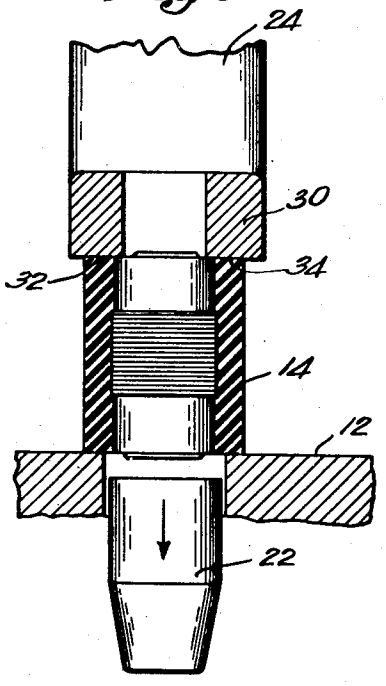
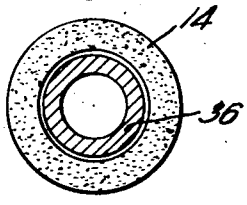


Fig. 10



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UNITED STATES PATENT OFFICE

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COT ASSEMBLING APPARATUS

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Application December 18, 1951, Serial No. 262,304

1 Claim. (Cl. 154—1)

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This invention relates to an improved method and apparatus for applying cots to the shell portions of antifriction top rolls of the type utilized in textile drawing machines.

In providing a cot body which can be tightly secured about the cylindrical shell of an antifriction top roll, it is customary, in at least one well known type of cot, to form the inner opening or bore of the cot with a diameter smaller than the outer diameter of the shell, and to expand the cot body as it is forced on over the shell. A coating of adhesive on the inner bore of the cot is moistened at the time of installation and this coating, when dry, further aids in securing the cot to the shell.

It has been found that the forces required to expand and press the cot on over the shell are of considerable magnitude, and if these forces are allowed to bear against the top roll spindle or the bearing race, there may occur a deformation of the race member. Such deformation is commonly referred to as "brinelling," and the operating characteristics of the top roll bearings are seriously impaired thereby. Definite objections are present to avoiding the difficulty by removing the inner working parts of the top roll from the shell. Difficulty is further experienced from the fact that in forcing the shell into contact with the moistened adhesive coating on the inner opening of the cot, portions of the moist adhesive may be scraped away from the cot bore and become transferred to the inner working parts of the top roll member, with clogging and other undesirable conditions being developed.

The present invention is concerned with the problems indicated in connection with installing cots and aims to devise a method and apparatus for applying cots, whereby any deformation of the ball bearing race is substantially eliminated and any tendency for adhesive to become transferred into the inner working parts of the top roll member is avoided. It is also an object of the invention to devise a simple, economical and efficient cot applying attachment which can readily be secured to various types of cot assembling machines, thus making use of the reciprocating ram element customarily found in such devices.

These and other objects and novel features will be more fully understood and appreciated from the following description of a preferred embodiment of the invention selected for purposes of illustration and shown in the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevational view showing parts of a cot assembling machine with

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the cot-applying attachment of the invention illustrated in an operative position;

Fig. 2 is a front elevational view illustrating the cot-applying device on a smaller scale.

Fig. 3 is an exploded view showing parts of the shell and ball bearing race support common to a top roll;

Fig. 4 is a view in elevation and partial cross-section illustrating a guide member forming part of the apparatus of the invention;

Fig. 5 is a side elevational view illustrating a top roll of the type including two cot members such as are installed with the aid of the cot-applying device of the invention;

Fig. 6 is a plan cross-section taken on the line 6—6 of Fig. 1;

Fig. 7 is a detail elevational view of a top roller shell shown engaged with a guide member of the invention, also indicated in cross-section;

Fig. 8 is a cross-section taken on the line 8—8 of Fig. 6, illustrating one position assumed by the apparatus of the invention in which a cot member has been partly started over the end of a top roll shell;

Fig. 9 is another view in elevation and partial cross-section showing the cot-applying apparatus in another position in which the cot member is fully installed on the top roll shell; and

Fig. 10 is a cross-section taken on the line 10—10 of Fig. 8.

With the above noted problems in mind we have devised an improved method of applying cots based on the novel concept of pressing a top roll shell into the cot body with the shell supported in a selective manner such that none of the forces involved are imposed on the bearing components of the top roll. At the same time the method of handling the shell is so carried out that a desirable sealing action is realized, effectually preventing any transfer of adhesive from the inner surface of the cot to the bearing components. The apparatus illustrated in the figures above referred to constitutes one desirable means for carrying out these operations.

Preferably our improved method is carried out, making use of certain parts of conventional cot assembling mechanism for exerting pressure. Therefore, a portion of one standard type of cot assembling machine has been indicated in the drawings as an aid to more fully understanding the invention. It should be understood, however, that the invention is not limited to this or any other particular cot assembling mechanism.

Thus, in Fig. 1 we have shown fragmentarily an upright portion 10 of a standard cot assem-

bling machine which carries an adjutsable cot holder base 12 adapted to detachably hold therein a cot body 14 in an upright position suitable for receiving the shell portion of a top roll R therein, as has been indicated in the drawings. The upper section of the upright portion 10 is formed with a transversely extending arm 16 having a vertically formed bore through which is slidably received a ram 18. The latter member is raised and lowered by manual operation of a handle 19 through some suitable mechanism such, for example, as a rack and chain, commonly employed, in devices of this class. It will be observed that the ram is in axial alinement with the cot body 14 when the latter is supported in the cot holder 12, as described above.

In accordance with one preferred embodiment of our invention, we provide for use with this pressure exerting mechanism a cot applying apparatus which includes driving means in the form of a pressure bracket member, generally denoted by the arrow 20, and a separate cot guide element consisting of a tapered nose piece 22.

This tapered nose piece 22 has been shown in Fig. 1 with a lower tapered end inserted in the cot body 14 in readiness to start a cot applying operation. As will be apparent from an inspection of Fig. 4, the nose piece generally comprises a cylindrical sleeve open at one end and formed at its opposite end with a solid tapered head. An important feature in the construction of the nose piece is that the open end is formed with an inner shoulder 22*a* and a sealing rim 22*b*. The shoulder and sealing rim portions are carefully chosen of a size such that one end of the top roll shell 36, Fig. 1, may be slidably received in the sealing rim and solidly supported against the shoulder 22*a*, in substantially sealing relationship, as has been better shown in Fig. 7, thereby precluding any transfer of adhesive into the bearing components.

Cooperating with the nose piece 22 is the pressure bracket member 20 of the invention, which member, as shown in Figs. 1 and 2, is formed with an elongated reinforced body portion 24. At the upper end of this body portion is provided an offset holder section 26 carrying a threaded post 28 which is adapted to be threaded into the lower end of the ram 18 so that the pressure bracket member may be raised and lowered with movement of the ram member.

At its opposite lower end the pressure bracket 20 is formed with a presser element 30 which extends transversely outwardly from the body portion 24 and presents a bifurcated end defining flat bottom driving surfaces 32 and 34 which are spaced apart from one another. When the pressure bracket is threaded into the ram, and the latter is in a raised position, the bifurcated end is located a sufficient distance below the upper holder section 26 to receive the upper end of the top roll member R in the position shown in Fig. 1. It is also pointed out that the opening between the bifurcated end 30 and the holder section 26 has been chosen sufficiently great to provide space through which the upper spindle end R' of the top roll member may move without interference when the bracket is depressed in response to movement of the ram 18.

As shown in Fig. 1, it will be observed that the top roll R has been indicated with one cot, not installed, so as to leave exposed the shell 36 already referred to above. In Fig. 3 the inner bearing components normally supported in this top roll shell 36 have been shown partially removed from the shell and, as will be apparent from an inspection of Fig. 3, include the spindle R', a ball bearing race support 38 on the spindle, and a ball bearing race 40 adapted to be rotatably mounted on the race support.

Attention is directed to the fact that the outer end of the race support 38 tapers inwardly away from the inner peripheral surface of the shell 36 and thus forms a narrow annular space which separates the shell and ball bearing race support from one another, as has been more clearly shown in Figs. 6 and 8.

An important feature of the invention is the provision of the driving surfaces 32 and 34 on the bifurcated end of the holder, with these surfaces being spaced apart a distance so chosen that the two surfaces in the position illustrated in Figs. 1, 6, 8 and 9, can bear on the top edge of the shell member 36 without coming into contact with the race support 38, as will be particularly evident from an inspection of the broken-away portion of Fig. 8. Such an arrangement provides for selective transmission of forces exerted from the ram 18 through the pressure bracket against the top roll shell without, in any way, imposing forces on the ball bearing race or its supporting member. Similarly, the opposite end of the shell is selectively engaged against the shoulder 22*a* without the lower race support 38 being contacted. In this way the shell throughout its length is selectively held and can then be driven or forced into the cot 14 without danger of impairing the bearing components.

The apparatus described may be employed either in assembling a new cot or in replacing a worn cot body with a fresh unit. It should be noted that the cot-applying means is especially desirable from a replacement standpoint since a worn cot element may be readily cut away from its supporting shell and a new unit installed without requiring any removal or adjustment of the bearing components of the top roll.

Considering one typical cot-applying operation, a cot member to be installed is first mounted in the holder 12 so as to assume a position such as that shown in Fig. 1. Thereafter the nose piece 22 is engaged in the upper exposed end of the cot 14 with the tapered head of the nose piece being pressed into the cot as far as it will go with a light pressure, as noted in Fig. 1. Thereupon the shell portion of a top roller unit, such as has been illustrated in the drawings, is fitted into the upper end of the nose piece in the sealed relationship already described so that the thin flanged rim 22*b* of the nose piece overlaps and snugly fits against the lower peripheral edge of the shell 36. In thus mounting the top roll unit upon the nose piece, the spacer section 42 of the top roll is passed between the bifurcated end of the pressure bracket 20, in the manner illustrated in Figs. 1 and 6, so that the flat driving surfaces 32 and 34 occur slightly above the top edge of the shell 36.

The handle 19 is then depressed, forcing the ram 18 and the pressure bracket 20 downwardly until the driving surfaces 32 and 34 engage against the top edge of the shell 36 in substantially the position shown in Fig. 8 of the drawings. Further downward movement of the ram 18 then causes the shell and nose piece assembly to be forced downwardly through the cot 14 during which period the nose piece 22 acts to spread and enlarge the cot body and thereby allows the shell 36 to readily pass into the cot opening. The downward movement is continued un-

til the bottom edge of the shell **36** has reached a position substantially flush with the bottom edge of the cot **14**, as has been suggested in Fig. 9. At this point the nose piece has passed through the cot **14** and falls through an aperture in the cot holder **12**, also as indicated at the lower side of Fig. 9.

In addition to the important operation of selectively holding the shell at its two opposite ends so that no pressure is exerted on the bearing components, there also occurs the very desirable sealing action which has been referred to at an early point in the specification, this sealing action being achieved by the overlapping arrangement of the nose piece rim **22***b* with respect to the forward or lower end of the shell **36**. It will be apparent that such an arrangement as that described precludes any likelihood of moistened adhesive material, occurring on the inner peripheral surface of the cot, being scraped away from the cot and transferred into the bearing components contained inside of the shell member.

It will be seen that we have provided a novel, simple, and efficient method and means for assembling cots on top roll shells, and that the bearing components of the top roll can be protected and shielded against pressure effects or entrance of foreign material in any way.

While we have shown a preferred embodiment of the invention, it should be understood that various changes and modifications may be resorted to in keeping with the spirit of the invention as defined by the appended claim.

We claim:

A device for inserting a tubular shell containing a bearing assembly at each inner end portion in an expansible hollow roll having a coating on its inner face, said device including a nose piece having one end tapered to form a guide for entering said expansible hollow roll, the body of said nose piece being of cylindrical form and of greater diameter than the unexpanded bore in said expansible hollow roll, the other end of said nose piece being formed with a countersunk inner annular shoulder for receiving and supporting an end of said shell, said shoulder being defined in part by an annular wall having such a diameter as to snugly enclose and seal the outer face of said shell adjacent its ends, whereby said shell during its movement into said expansible hollow roll is spaced from the inner coated wall of said roll and the coating material is sealed from passage into contact with the bearing assemblies within the shell.

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