Aug. 4, 1959 J. WOODS ET AL 2,897,647

MACHINES FOR THE MANUFACTURE OF CORDS OR THE LIKE

Filed Oct. 28, 1955 2 Sheets-Sheet 1

FIG. 1

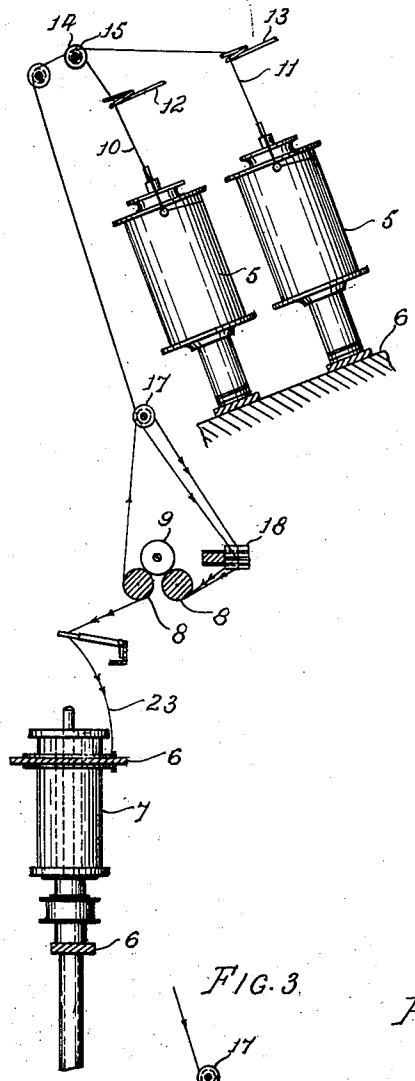


FIG. 2.

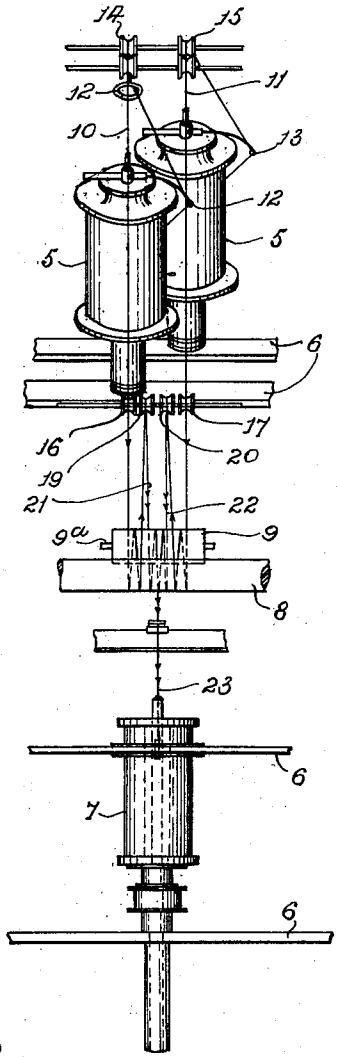


FIG. 3.

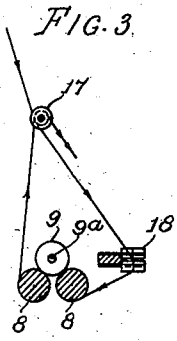
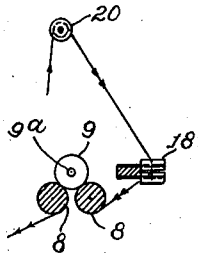


FIG. 4.



Aug. 4, 1959 J. WOODS ET AL 2,897,647

MACHINES FOR THE MANUFACTURE OF CORDS OR THE LIKE

Filed Oct. 28, 1955 2 Sheets-Sheet 2

FIG 5.

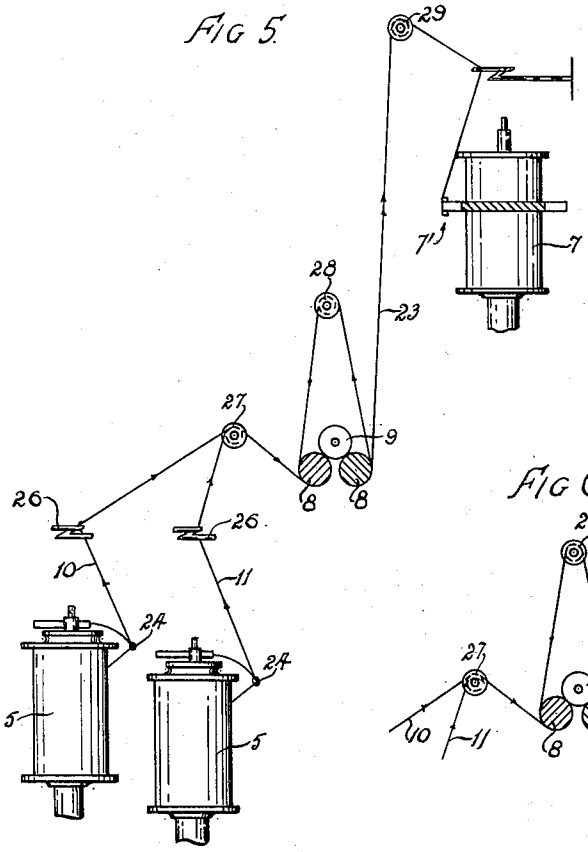
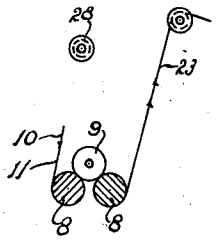


FIG 6.

FIG 7.



INVENTORS.
Joseph Woods and
Harold Schofield.
By Ross Ross. Attys.

United States Patent Office 2,897,647
Patented Aug. 4, 1959

2,897,647

MACHINES FOR THE MANUFACTURE OF CORDS OR THE LIKE

Joseph Woods and Harold Schofield, Rochdale, England, assignors to John Bright & Brothers Limited, Lancashire, England

Application October 28, 1955, Serial No. 543,564

Claims priority, application Great Britain July 13, 1955

1 Claim. (Cl. 57—60)

This invention has reference to machines for the manufacture of cords or the like, and has for its object to provide mechanism which will perform the functions of two machines as used at present for the same purpose, thus greatly increasing the production and efficiency in manufacture and decreasing the space occupied by the machine.

Broadly, the invention contemplates doing in two stages of one operation what has hitherto been done on two machines as two distinct operations. These two stages may be referred to, for convenience, as "twisting" and "cabling." The twisting stage provides either for adding more turns of dry yarn or thread drawn off the bobbins, herein referred to as supply bobbins, or for the twisting together of a plurality of dry yarns or threads drawn off the supply bobbins. Both of these operations are done on a set of rollers, the threads or yarns after leaving this set of rollers being, in the second stage, combined or cabled on the same or on a further set of rollers, the final product being wound on a delivery bobbin, or formed into any suitable package.

The invention is more particularly set forth with reference to the accompanying drawings in which:

Fig. 1 is an end view of a part or one head of a machine for carrying the invention into practice, certain parts being in section and the whole constituting one unit, the first and second passes of the thread being indicated by single and double arrows respectively;

Fig. 2 is a front view of the same unit;

Fig. 3 is an end view of the rollers showing the first pass of the thread indicated by single arrows, and the beginning of the second pass indicated by double arrows;

Fig. 4 is an end view of the rollers showing the end of the first pass of the thread indicated by a single arrow, and the second pass indicated by double arrows;

Fig. 5 is a schematic end view of the invention as used for operating upwardly, that is in the direction opposite to that already shown;

Fig. 6 is a side view of the roller arrangement and the course of the threads upwardly in the first pass; and

Fig. 7 is a view, similar to Fig. 6, showing the same rollers with the thread on the second pass.

For convenience, the invention will be described with reference to its use in making a cord, which is a typical example, in which two twisted dry threads or yarns are combined to form a cord, but it is to be understood that it may be used for combining more than two such twisted threads or yarns, and the term "cord" is used for convenience, as the final product may not, in every instance, be one to which the term "cord" would normally be applied.

In carrying out the invention therefore in making a doubled cord, the supply packages of dry yarn or thread **5** and **5**, which may be natural or man-made, are mounted on a machine **6** above a set of horizontal rollers, below which take-up bobbins **7** or the like, on which the final product is wound, are also mounted on the machine

6; the course of the yarn is thus generally downward from above to below though there are certain intermediate upward movements of the yarn. Both of the top bobbins **5** and **5** and the bottom bobbin **7** are driven by suitable mechanism on and forming part of the machine.

Certain yarns, e.g. man-made yarns, are required to have more turns per inch inserted than those provided in the package and where this is so, the extra turns are put in in the first stage as the yarn is brought down from the top packages to the rollers below, and for this purpose, a flyer is used on the top bobbins.

Extending from end to end of the machine is a driven roller **8** or there may be, as shown in the drawings, two such driven rollers **8** and **8**, both driven and separate from each other, the two rollers when used being parallel to each other. These rollers **8** and **8**, may not be continuous from end to end of the machine, but may be made in sections or "heads" so that one section or head can run or be stopped without affecting the others. Resting on the top of the driven roller **8**, or on the two driven rollers **8** and **8**, when two are used, is what for convenience is referred to as a "top roller" **9**, which term includes a single roller or two, three or more rollers end to end.

The top roller **9**, whether a single or multiple, is mounted on a spindle **9***a* carried at its ends in pivoted supporting arms mounted on the machine, so that it can be raised from the roller or rollers below. These arms are not shown in the drawings. It is to be understood that there is one of these top rollers **9**, single or multiple, for each bobbin or package **7** on which the final product is wound. While a single or multiple top roller **9** may be used with a single driven roller **8**, it is preferable to use two parallel driven rollers **8** and **8**, as shown, as this provides a double nip on the thread or yarn passing round the rollers.

Assuming that there are two driven rollers **8** and **8**, and a single top roller **9**, as shown, the threads **10** and **11** from the supply bobbins **5** and **5**, are carried through guide eyes **12** and **13** over free pulleys **14** and **15** and corresponding front guide pulleys and downward across the front of lower free guide pulleys **16** and **17**, through guide eyes **18** and under the driven roller **8**, over the top roller **9** and down and under the other bottom roller **8**, the top roller **9** resting on the threads **10** and **11** which is thus nipped between the top and bottom rollers, and the twist held and if there are two or more threads the twist in them is held as they are brought together to form a single thread, as these threads which are remote from the middle of the rollers, leave the rollers they are carried up and over pulleys **19** and **20** lying between the pulleys **16** and **17** to bring them back behind the driven roller **8** under which they were first passed, and the two threads are again threaded round the bottom and top rollers **8** and **9** as before, but this time the threads lie between the two threads **21** and **22** drawn off from the supply bobbins **5** and **5**, and this time they come out from the middle of the rollers wound together into a cord **23**, which is wound up on the bottom bobbin **7**.

It is convenient to mount the supply bobbins **5** and **5** above the rollers, and to work in a downward direction to the bobbins **7**, but it is not necessary to work in this direction as it may be desirable to work in the reverse direction, or even to work horizontally, but it will be understood that the necessary guides and pulleys over which the yarn or thread is passed will be varied according to the direction of movement from the supply to the delivery bobbins, both of which in all constructions are driven. In Figs. 5, 6 and 7, an arrangement for upward working is shown and in this arrangement the supply packages **5** and **5** for the yarn or thread

are mounted at a low position on the machine with the take-up bobbin **7** above.

The threads **10** and **11** from the supply packages **5** and **5** are drawn off through the flyers **24** and the guide eyes **26** over a free roller or rollers **27** from which both threads pass parallel with each other under the front bottom roller **8** around the top roller **9** and under the bottom back roller **8**, whence they pass up to and over the roller **28** and come down again, this time being close together and between the threads **10** and **11** passing under the front bottom roller **8** as they come from the supply packages **5** and **5**; this position is shown in Figs. 5 and 6 which ends the first pass. As the two threads together again encounter the front bottom roller **8**, see Fig. 7, they are carried round the rollers **8**, **9** and **8** as before in the second pass and are combined into one cord **23**, which is taken over the roller **29** and wound on the take-up bobbin **7** after first being given a final twist by a ring and traveller mechanism **7'** of the well known form and function.

If the initial turns of yarn or thread on the supply bobbins **5** and **5** are, what is known as Z twist, the final cord **23** will be of S twist, which as will be appreciated, is the reverse of the Z twist so that a firmly wound cord results, though any direction of twist can be used according to requirements.

If the yarn or thread used in the machine be man-made, it is not likely to have the twist in it which is required. It may, for instance, have two and a half turns per inch when twelve are required, and in these conditions flyers or their equivalent are used on the bobbins **5** and **5**, to put in the additional turns required, but these, when used, are of conventional form and are not shown in the drawings. If the yarn or thread be made from natural fibres, e.g. cotton, and the required number of turns is already provided, the flyers will be used, not for the purpose of putting in additional turns but to combine two, three, or more into one strand before the second stage of cording; in both uses the same arrangement and operation are conducted by the rollers.

Where the top roller **9** is of multiple form, it may have two outside rollers for the first stage of the operation, and an inside roller for the second or cording stage. The top roller is not positively driven as are the bottom roller or rollers **8** but is rotated by the frictional engagement with the yarn or thread, and the bottom roller or rollers.

While the invention has been described with reference to the use of one set of rollers for the two stages, it is to be understood that two sets of rollers may be used, one for the first stage and another for the second stage, and in this event the sets of rollers would be parallel and the first pass of the thread would be round the first set and the second pass round the second set; such sets of rollers may both be alike, i.e. with one driven roller or two driven rollers, or there may be one set of each arrangement.

We claim:

In a multi-purpose unitary machine for the manufacture of cords, a plurality of supply bobbins each positively rotating in a single direction and from which dry yarns are drawn and twisted in one direction, a take-up bobbin rotated in a direction opposite to the direction of rotation of the supply bobbins of said plurality thereof, a tripple roller system disposed between said supply and take up bobbins and having at least one driven roller and providing a pair of nips at each pass of the yarns for holding the twist while the ends of the twisted yarns are brought together, the brought-together ends of the yarns being cabled en route from the rollers of said roller system to said take-up bobbin, the speed of rotation of the supply bobbins of said plurality thereof and said take-up bobbin being related to the speed of rotation of the rollers of said roller system, the direction of twist in the yarns being reversed in the cabling.

References Cited in the file of this patent

UNITED STATES PATENTS

364,784	Tynan	June 14, 1887
525,192	Duffy	Aug. 28, 1894
790,805	Salathe	May 23, 1905
1,390,081	Bonner	Sept. 6, 1921
1,516,576	Pease	Nov. 25, 1924
1,687,261	Spink	Oct. 9, 1928
2,004,139	Taylor	June 11, 1935
2,306,377	Bird et al.	Dec. 29, 1942
2,353,432	Arrington	July 11, 1944
2,365,661	Winslow	Dec. 19, 1944
2,407,358	Whisnant	Sept. 10, 1946