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SPOOL CLEANING MACHINE

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2 Sheets-Sheet 2

Fig. 2.

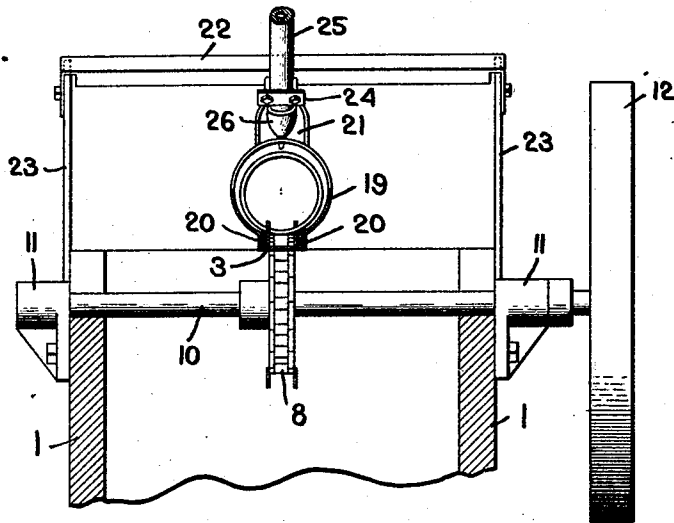


Fig. 3.

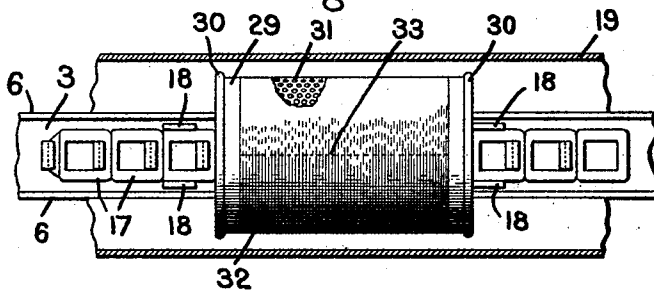
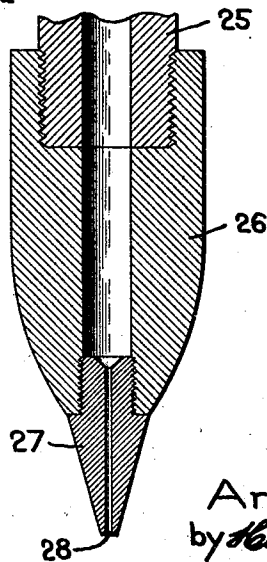


Fig. 4.



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## UNITED STATES PATENT OFFICE

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## SPOOL-CLEANING MACHINE

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This invention involves a machine and a process for cleaning spools and other yarn carriers of a mass of yarn remaining thereon by severing the yarn mass so that it may readily be brushed or removed from the spool or yarn carrier. The invention is more particularly designed for use in connection with yarn carriers of the type of large metal spools upon which artificial silk is wound either immediately after its production or in the course of the handling of the yarn in the various operations to which it is subjected.

The invention involves the use as a severing agent of a fine jet of water under high pressure. Such a jet of water cuts very readily through a mass of artificial silk and will also cut through yarns formed of other fibres.

The invention further involves a support for the yarn carrier or spool and means for giving a relative traversing movement between the powerful jet of water and the spool support so that the jet will travel across the yarn wound on the spool and thus cut through the entire length of the yarn mass.

More specifically the invention has for its object to provide a machine in which an endless conveyor traverses a series of spools or yarn carriers past a fine jet of water under high pressure so that the spools are fed past the jet with the jet in close proximity to the periphery of the spools and so that the jet will cut through the mass of yarn on the spools and thus enable them readily to be cleaned.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

The drawings illustrate a simple and preferred form of apparatus for carrying out the invention with the yarn carriers shown as relatively large metallic spools such as are commonly employed to receive artificial silk just after it is formed. These spools are commonly made of aluminum and are about six inches in length. When the silk strand is unwound from these spools, some of the fine fibres composing the strand frequently break during the unwinding operation and as it is

difficult to pick up the fibres again, the result is that the unwinding operation has to be stopped with a mass of yarn varying in amount remaining upon the spool. This mass of yarn has to be cut off and removed from the spool and this operation is performed with considerable difficulty and requires much labor. The invention therefore is peculiarly useful in severing the masses of yarn remaining on such spools, thus enabling the yarn readily to be removed and the spools left clean for further use. But it is to be understood that the specific construction illustrated is but an example of the uses to which the invention in its broader aspects may be put.

In the drawings:

Fig. 1 is a view in side elevation and partially in vertical cross section of the apparatus.

Fig. 2 is a view in vertical cross section taken on the line 2—2 of Fig. 1.

Fig. 3 is a detail partially in plan and partially in horizontal cross section showing a portion of the endless conveyor and one of the spools passing through the casing of the machine.

Fig. 4 is a detail in longitudinal cross section of the nozzle through which the jet of water is directed under high pressure.

The machine illustrated presents a main frame having a box-like structure 1 supported by suitable standards 2 to bring the top at a convenient height. A narrow support or bed 3 extends centrally and longitudinally across the top of this frame and is extended back a considerable length and supported at its rear end upon a bar 4 carried by standards 5. This support or bed 3 is preferably formed of metal and has its side edges flanged or upturned at 6. At its forward end this bed or support projects over a shallow table 7.

An endless conveyor 8 shown as a chain made up of flat links runs over and is supported by the bed 3. This conveyor is driven by a sprocket wheel 9 mounted on the main shaft 10 journalled in bearings 11 secured to the opposite sides of the machine frame 1 and this main shaft 10 is shown as driven

by a pulley 12 from a suitable source of power. At its rear end the endless conveyor runs over a sprocket wheel 13 carried by a shaft 14 supported similarly to the shaft 10 on the machine frame. An idler sprocket 15 carried by a shaft 16 is mounted midway and beneath the conveyor to take up the slack. This endless conveyor is preferably formed of a series of flat links 17 and at regular intervals one of these flat links is provided with upturned ears or fingers 18. The links carrying these fingers 18 are spaced apart a distance somewhat greater than the length of the spool to be traversed through the machine by the conveyor and are so arranged that they project against the end of the spool and thus advance the spool with the conveyor.

An open-ended metal casing 19 extends over a section of the bed or support 3 and is of a size in cross section slightly larger than the spools. This casing is shown as of generally circular cross section flanged at its lower edges 20 and with these flanges secured to the upstanding flanges 6 of the bed 3.

Near its forward end the casing 19 is provided at the top with an opening 21. A cross beam 22 is mounted directly above this opening and is supported by standards 23 secured to the sides of the machine frame 1. Upon this cross beam 22 is rigidly mounted by means of the clamp 24 a pipe 25 carrying at its lower end a nozzle 26. This nozzle is so mounted that its mouth extends in close proximity to the periphery of the spools or yarn carriers carried along by the endless conveyor and the axis of the nozzle extends in the vertical plane of the carrier axis or path and at an acute angle thereto. The nozzle is shown more in detail in cross section in Fig. 4 and comprises the main body 26 and a tip 27 threaded therein and presenting the fine orifice 28.

The yarn carriers illustrated are shown as large, cylindrical spools 29 formed of aluminum having slightly projecting heads 30 and perforated barrels 31. Such spools are commonly used to receive artificial yarn wound thereon directly from the formation of the fibres in the process of manufacturing artificial silk.

Water is supplied to the nozzle 26 under very high pressure, two thousand pounds per square inch having been found a desirable pressure. The endless conveyor is driven at a suitable speed, for example, at a speed sufficient to traverse thirty spools per minute past the nozzle. The fine jet of water which issues from the jet comes immediately against the mass of yarn 32 remaining on the spools and this fine jet of water cuts directly through the mass of yarn along a line indicated at 33 in Fig. 3. The action of the jet is a powerful one and, especially in the case of artificial silk, cuts cleanly through the yarn down to the barrel of the spool. It is usual,

in the winding of such spools, to leave a slight space between the yarn mass and the heads of the spool so that an inclined jet, such as illustrated, readily passes over the heads and cuts the yarn mass cleanly throughout its entire length.

As the spools pass the jet, they are delivered by the carrier on to the table 7, and if the yarn mass has not already fallen off the spools, it is readily removed or brushed off by hand.

The casing 19 is an important feature protecting the hands of the operative against the action of the powerful jet of water and also preventing the water from being splashed or thrown around.

There is thus presented a very simple and efficient machine and process for removing yarn from yarn carriers in a practical, efficient and rapid manner.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A machine for severing yarn on a yarn carrier comprising a support for the yarn carrier, means for directing a fine jet of water under high pressure, and means for effecting a relative traversing movement between the jet and the support to cause the jet to travel across and cut through the yarn on a yarn carrier mounted on the support.

2. A machine for severing yarn comprising a bed, an endless conveyor provided with spool-engaging elements and running over the bed and adapted to receive and traverse the spools endwise, an open-ended casing extending over a section of the bed and conveyor and a nozzle mounted to project into the casing and to direct a fine jet of water under high pressure immediately above the path of the spools and in the center line thereof.

3. A machine for severing yarn on spools comprising a spool support, a nozzle for directing a fine jet of water under high pressure mounted with its mouth immediately adjacent the periphery of a spool carried by the support and with its axis in the plane of the spool axis and at an acute angle thereto, and means for effecting relative bodily movement between the nozzle and the spool support to cause the spool to pass the nozzle in the direction of the spool axis.

4. A machine for severing yarn comprising an endless conveyor having spool-engaging fingers adapted to receive and traverse in an endwise direction spools partially wound with yarn, and a nozzle for directing a fine jet of water under high pressure mounted with its mouth immediately adjacent the periphery of a spool carried by the conveyor past the nozzle and with the axis of the nozzle in the plane of the spool axis and at an acute angle thereto.

5. A machine for severing yarn comprising the construction defined in claim 4, to-

gether with means for adjusting the nozzle bodily toward and from the conveyor.

5 6. A machine for severing yarn comprising a bed, an endless conveyor running over the bed and having spool-engaging fingers adapted to receive and traverse the spools in the direction of their axes, an open-ended casing extending over a section of the bed and conveyor and means for supplying a fine jet of water under high pressure through the top of the casing against the spools as they pass through the casing in the direction of their axes past the nozzle.

15 7. The process of severing artificial silk yarn wound on a carrier which consists in directing a fine jet of water under high pressure against the silk yarn mass while giving a relative traversing movement to the jet and the carrier to cause the yarn mass to move relatively to and past the jet.

20 8. The process of severing artificial silk yarn wound on a carrier which consists in directing a fine jet of water under high pressure against the silk yarn mass while giving a relative traversing movement to the jet and the carrier to cause the yarn mass to move relatively to and past the jet with the path of the jet extending in the plane of the carrier axis and at an acute angle thereto.

30 In testimony whereof, I have signed my name to his specification.

ARCHIE G. BAKER.

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