

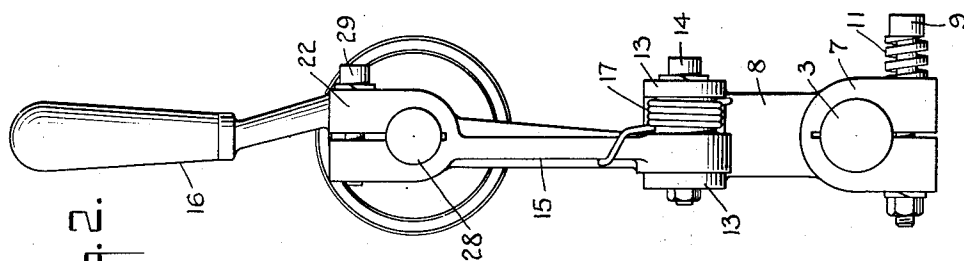
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F. KING

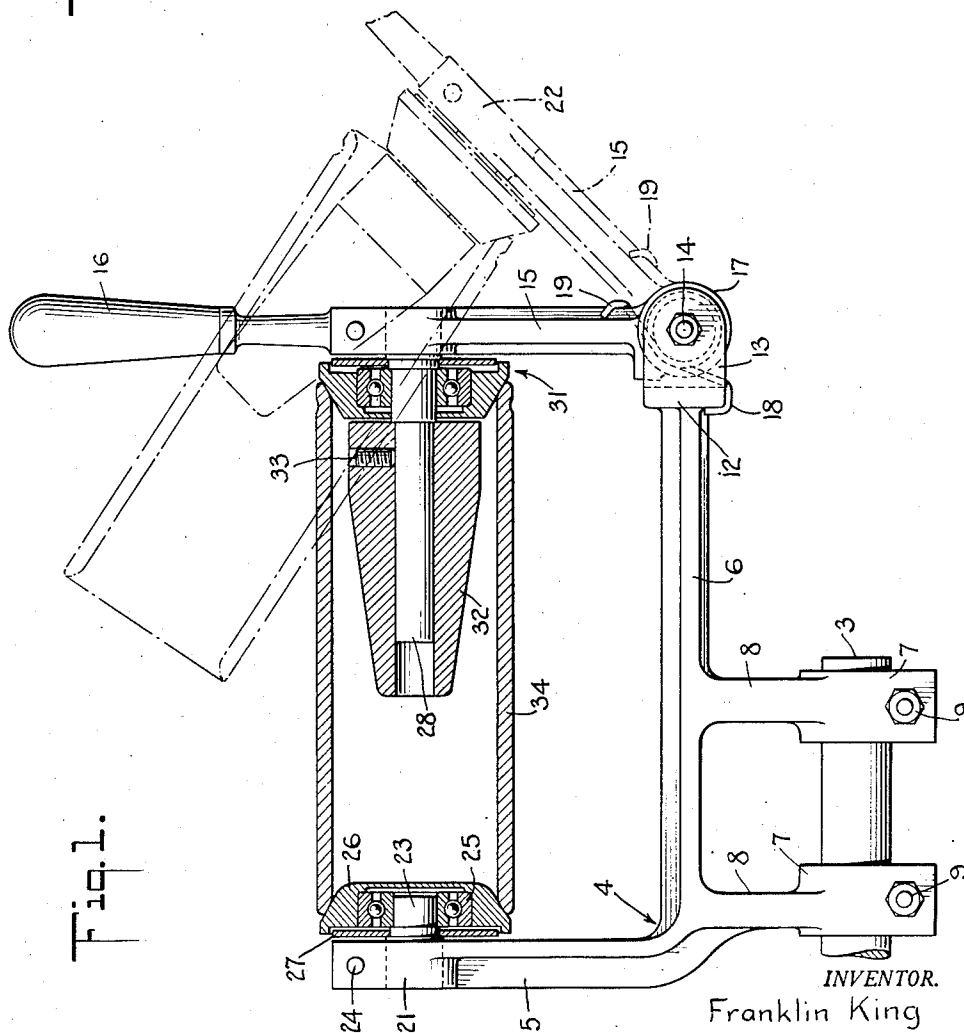
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CHEESING MACHINE

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2,337,112

CHEESING MACHINE

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This invention relates to cheesing machines for winding and twisting and winding yarn into headless yarn packages such as cheeses, and relates more particularly to a tube holder assembly for use in such machines. An important object of this invention is the provision of an improved tube holder assembly for cheese winding machines characterized by features ensuring easier tube loading and yarn package unloading, whereby time is saved and damage to yarn windings avoided.

Another object of this invention is to provide a tube holder assembly for cheese winding machines having means for supporting the tube and yarn package during the loading and unloading operations, respectively.

Other objects of this invention, together with certain details of construction and combination of parts, will appear from the following detailed description and drawing.

In the drawing, wherein a preferred embodiment of my invention is shown,

Figure 1 is a side elevational view, partly in section, of the tube holder assembly of my invention, the dot-dash lines showing the position of the pivoted arm and tube during the loading and unloading operations, and

Figure 2 is a side elevational view of my tube holder assembly.

Like reference numerals indicate like parts throughout both views of the drawing.

In the drawing, reference numeral 3 indicates the fixed horizontal cross bar of a winding machine in which a revolving cork covered friction roller causes the tube or yarn holder to rotate at a predetermined speed when the tube or yarn holder is placed in contact therewith, and the yarn is distributed over the length of the tube or yarn holder by means of a suitable reciprocating guide. Such winding machines are well known in the art. An L-shaped bracket, generally indicated by reference numeral 4, having a short arm 5 and a long arm 6, is journaled on the cross bar 3 by split bearings 7 attached to bracket 4 by means of integral arms 8. The bracket 4 is adapted to be pivoted about the cross bar 3 and may be maintained in any desired position relative thereto by a suitable frictional force applied through split bearings 7 by means of screw bolts 9 carrying expansible springs 11.

The free end of arm 6 of bracket 4 has an enlarged portion 12 which may be integral with arm 6. This enlarged portion 12 is bifurcated to form ears 13, in which ears is journaled a pin 14. An arm 15 which is provided with a handle 16

is pivoted on pin 14 and is normally mounted in a position parallel to arm 5 of bracket 4 and at approximately 90° to arm 6 by means of a spring 17 one end 18 of which is attached to enlarged portion 12 of arm 6 and the other end 19 of which is attached to arm 15.

The upper extremity of arm 5 and the central portion of arm 15 are enlarged and formed into split bearings 21 and 22, respectively. Bearing 21 is adapted to receive a short shaft 23 which is held against rotation in said bearing by means of screw bolt 24. Shaft 23 carries a ball race 25 on which is fixed a cone-shaped member 26 preferably made of steel. The rear portion of said cone-shaped member 26 is countersunk to receive a disc 27 fixed to shaft 23. This disc is employed to keep the ball race free of dust and dirt, as is well understood in the art. Split bearing 22 is adapted to receive one end of a shaft 28 which is held against rotation by means of screw bolt 29. Shaft 28 is much longer than shaft 23 and has mounted thereon a ball-bearing steel cone-shaped member, generally indicated by reference numeral 31, which is substantially similar in structure to the cone-shaped member 26 carried by shaft 23. Shafts 23 and 28 are on the same center-line and the cone-shaped members carried thereby are substantially concentric. Shaft 28 also carries a conical member 32 which is fixed against rotation on shaft 28 by means of a set screw 33. The purpose of said conical member is to support the tube or yarn holder 34 and the complete package when the arm 15 is manually swung away from the bracket 4 by means of handle 16 in the manner indicated in dot-dash lines in Figure 1 of the drawing.

In operation, the arm 15 is moved sufficiently far to the right against the action of spring 17, as shown in Figure 1 of the drawing, to permit the slipping of tube 34, which is preferably of cardboard, over cone-shaped member 32 and in contact with cone-shaped ball-bearing member 31. Upon release of arm 15 the tube centers itself on the two ball bearing conical members which are concentric. The entire assembly is then pivoted about cross bar 3 until the tube 34 comes in contact with the revolving cork roller of the winding machine which causes the tube to revolve at the desired speed. Yarn is then attached to the tube and is distributed over the length of the tube by means of a suitable reciprocating guide. As the tube revolves, the yarn package is built up until one of the desired size is reached. The assembly is then swung upward, pivoted about cross bar 3, until it reaches a ver-

tical position as shown in Figure 1 of the drawing. Arm 15 is now swung to the right a sufficient distance to allow the completed package to be lifted off by inserting fingers in the open end of the tube. Due to the special shape of the conical member 32 the yarn windings cannot touch any part of the tube holder assembly.

The tube holder of my invention has many advantages over the expanding mandrel tube holder heretofore employed on cheese winding machines. Thus, it is easy to load an empty tube thereon and to unload the finished yarn package or cheese therefrom without damage to the yarn windings.

Yarn packages cannot bind or become difficult to remove from my yarn holder due to the variations in the internal diameter of the tubes. Furthermore, no pressure or force is required to remove the cheese from the holder, or to load empty tubes thereon, and it is unnecessary to touch the yarn windings in unloading the completed package, thus avoiding contamination. My tube holder is of simpler construction than tube holders heretofore employed since no springs or expanding sleeves are necessary to hold the tube in position during the winding operation, thus requiring less maintenance. Since my tube holder does not have an expanding mandrel, thin walled tubes may be used without causing any distortion along the length of the tube. This feature effects considerable economy in tube cost. The device of my invention is especially suitable for use at the gear box end of the winding machine where normally many packages are soiled or damaged by coming into contact with the frame of the gear box when removing the completed package from the expanding type of mandrel. With the cone type of mandrel employed in the present invention, this cannot happen.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a cone-shaped member mounted on said bracket, a cone-shaped member carried by said arm, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket.

2. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a rotatable cone-shaped member mounted on said bracket, a rotatable cone-shaped member carried by said arm, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket.

3. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an

arm pivotally carried by said bracket and adapted to be moved relative thereto, a shaft fixed to said bracket and a second shaft fixed to said arm, said shafts having a common-center line, a cone-shaped member mounted for rotation on each of said shafts, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket.

4. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a shaft fixed to said bracket and a second shaft fixed to said arm, said shafts having a common-center line, ball races on each of said shafts, and a cone-shaped member fixed to each of said ball races whereby said cone-shaped members are freely rotatable relative to said shafts, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket.

5. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a cone-shaped member mounted on said bracket, a cone-shaped member carried by said arm, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket, said retaining means comprising a cone-shaped member mounted on said arm concentric with the other cone-shaped member carried thereby.

6. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a rotatable cone-shaped member mounted on said bracket, a rotatable cone-shaped member carried by said arm, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket, said tube retaining means comprising a non-rotatable cone-shaped member mounted on said arm concentric with the other cone-shaped member carried thereby.

7. In a tube holder assembly for winding machines, the combination with means for supporting said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a shaft fixed to said bracket and a second shaft fixed to said arm, said shafts having a common-center line, a cone-shaped member mounted for rotation on each of said shafts, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket, said tube retaining means comprising a cone-shaped member fixed against rotation on said second shaft.

8. In a tube holder assembly for winding machines, the combination with means for support-

ing said assembly on a winding machine, of a bracket attached to said supporting means, an arm pivotally carried by said bracket and adapted to be moved relative thereto, a shaft fixed to said bracket and a second shaft fixed to said arm, said shafts having a common-center line, ball races on each of said shafts, and a cone-shaped member fixed to each of said ball races whereby said cone-shaped members are freely ro-

tatable relative to said shafts, said cone-shaped members being adapted to hold a tube therebetween, and means for retaining said tube on the tube holder assembly upon movement of said arm in a direction away from said bracket, said tube retaining means comprising a cone-shaped member fixed against rotation on said second shaft.

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