April 10, 1934. H. C. HICKS ET AL 1,954,129

HANK HOLDER FOR WINDING MACHINES

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Fig. 1.

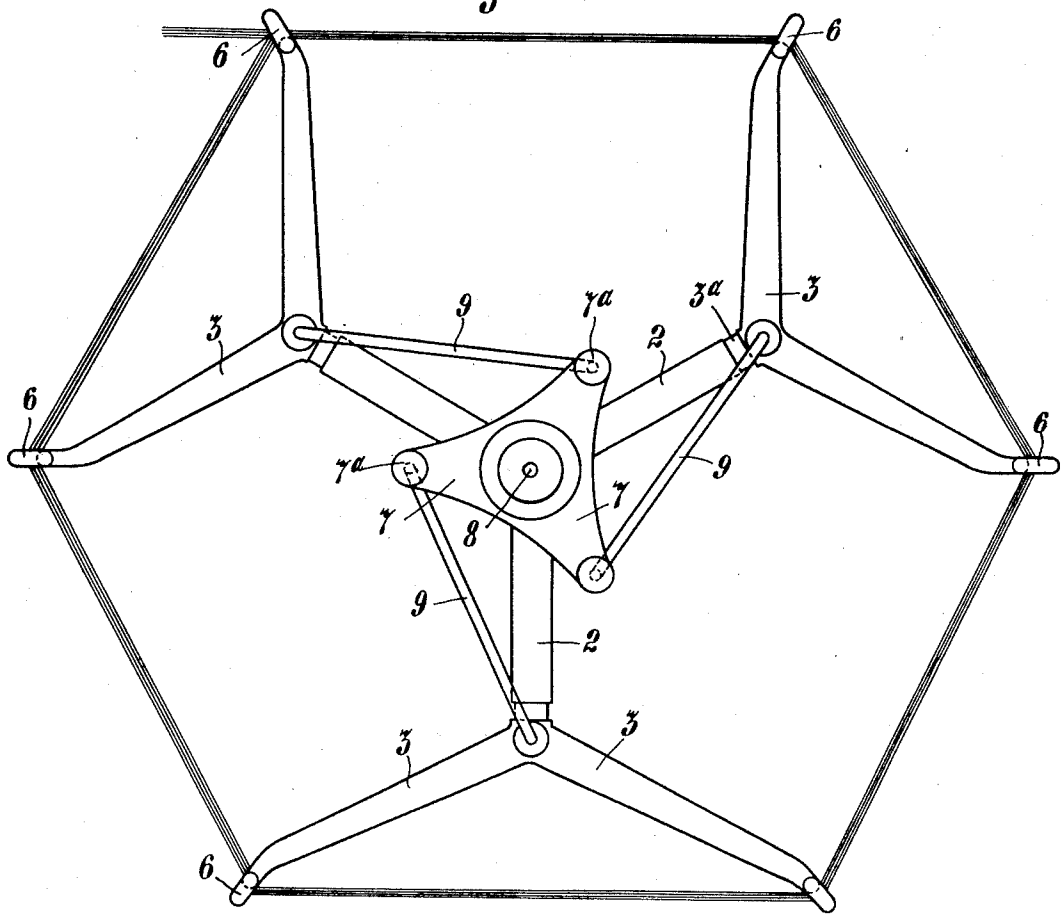
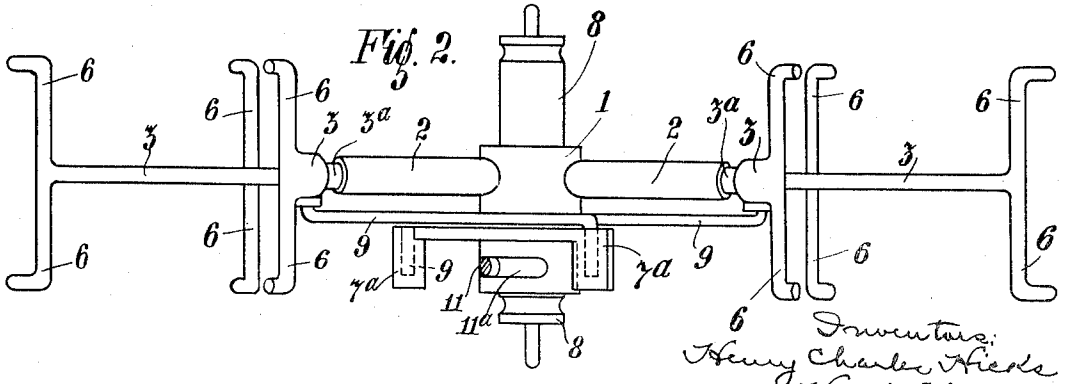



Fig. 2.




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Fig. 3.

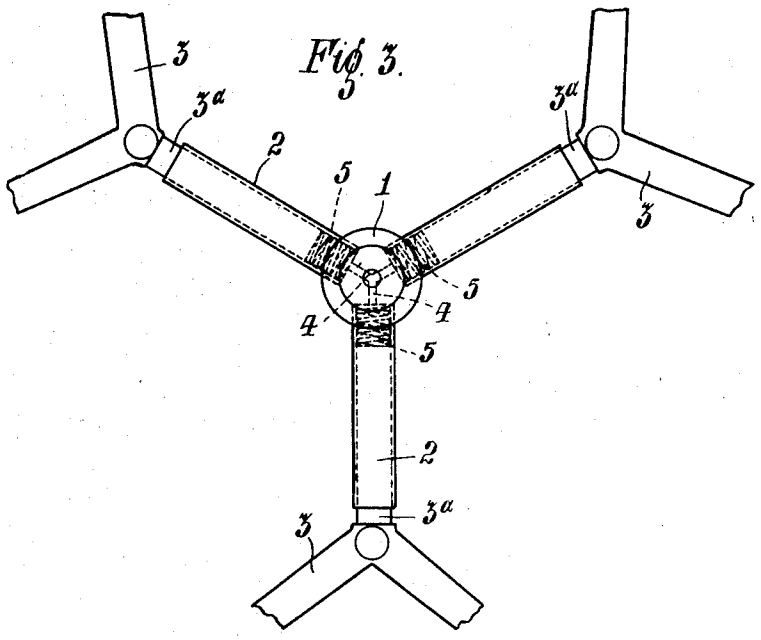
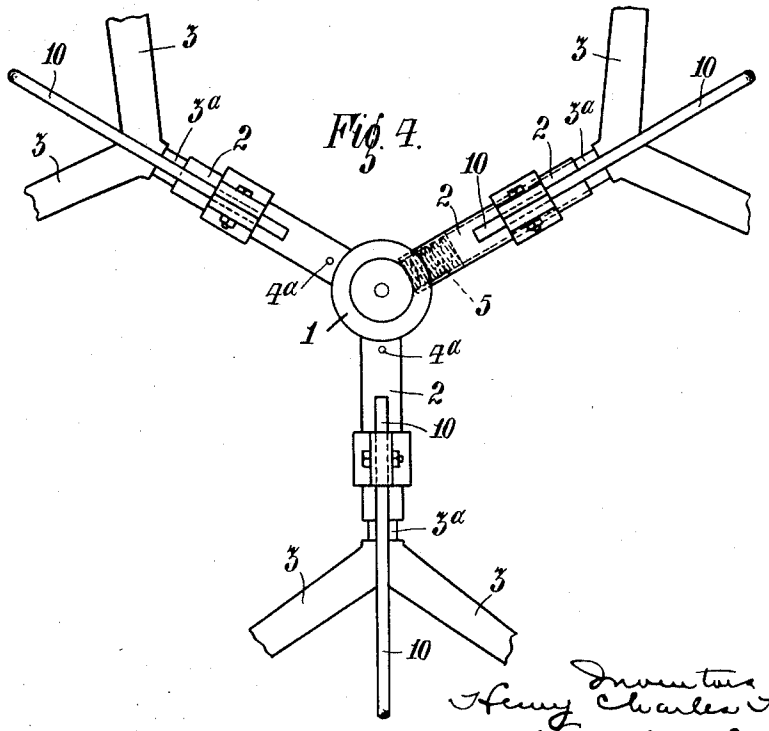



Fig. 4.




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# UNITED STATES PATENT OFFICE

1,954,129

## HANK HOLDER FOR WINDING MACHINES

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Application November 15, 1932, Serial No. 642,766
In Great Britain February 3, 1932

6 Claims. (Cl. 242—113)

This invention relates to the winding of yarn, single or doubled, from hanks on to bobbins, cops, pirns, cheeses and the like, its object being to provide improvements therein.

According to this invention, a machine for winding yarn from hanks on to bobbins, cops, pirns, cheeses and the like (for convenience, simply referred to hereafter as "bobbins"), is provided with hank holders or swifts, the arms of which have radial adjustment within predetermined limits, characterized by the arm of each swift being slidably supported and movable inwardly against resilient means, and (or) synchronously movable inwardly and outwardly by means connecting each arm to a suitably shaped member capable of turning movement on the swift spindle or boss relatively to the swift itself. Springs may be provided in each socket to keep the arms extended at low speeds. Air may be used as a cushioning and balancing medium; for example, by arranging the arms to slide in suitable sockets attached to the hub of the swift, said sockets, preferably, having air outlet holes, adjustable in size or capable of being closed, if desired, and (or) being in communication with each other by means of holes or passages in the hub. The sockets may contain or support spring means to keep the arms of the swift extended, means being, in such cases, provided to prevent the springs pushing the arms out of their sockets.

The invention will now be described, merely by way of example, with reference to the accompanying drawings, wherein:—

Fig. 1 is an elevation of a swift, constructed in accordance with the invention, and showing the arms in their inmost position.

Fig. 2 is a plan view corresponding to Fig. 1.

Fig. 3 is a fragmentary elevation of the swift with parts removed, corresponding to Fig. 1.

Fig. 4 is a fragmentary elevation of a modification of the swift in accordance with the invention.

Referring to the drawings:—

In the example shown at Figs. 1 to 3, the swift comprises a hub 1 having sockets into which are screwed, or otherwise fixed, three metal or other suitable tubes 2, corresponding in number to the number of arms 3 on the swift, a hole 4 being drilled from each socket into the centre of the hub 1 of the swift, where said holes 4 communicate with each other. Each arm 3 is made with a plunger portion $3^a$ adapted to slide in the aforesaid tubes 2, helical compression springs 5 being provided in the tubes 2 to urge the portion $3^a$ and arms 3 outwards, and maintain the hank taut at low speeds at which the centrifugal action may not be sufficient for this purpose. One or more forks 6, for supporting the hank of yarn, is provided on each arm 3. The arms 3 are connected to a coupling member 7 mounted on the spindle 8 and being freely turnable thereon, said member 7 having a number of projections $7^a$ corresponding to the number of arms 3 on the swift and in each of which the cranked end of a rod 9 engages. The other end of each rod 9 is likewise cranked and engages in a recess in the corresponding arm 3. The arrangement is such that when the turnable member 7, having the projections $7^a$ thereon, is turned owing to one or more of the arms 3 of the swift being moved inwards, or outwards, by centrifugal action, the other arms 3 will be similarly moved in synchronism according to the direction in which the turnable coupling member 7 is turned, thereby keeping the hank running true, that is, maintaining the centre of gravity of the holder on the axis of rotation and thus ensuring smooth running of the holder in its bearings. The member 7 is retained on the hub or boss 1 by means of a screw 11 engaging a slot $11^a$ in the member 7. The screw 11 also limits the amount of movement of the member 7 and therefore the extent to which the arms may be extended by the springs 5.

In the example shown at Fig. 4, the swift comprises a hub 1, into which are screwed, or otherwise fixed, metal or other suitable tubes 2, corresponding in number to the number of arms 3 on the swift. Each arm 3 is made with a plunger portion $3^a$ adapted to slide in the tubes 2, helical springs 5 being provided in the tubes 2 to urge the arms 3 outwards and maintain the hank taut at low speeds, one or more forks 6 (not shown), for supporting the hank of yarn, being provided on each arm 3. Combined stoppers and guides 10 for preventing the arms 3 from being pushed out of the hub tubes 2 by the helical springs 5, are provided, the stopper guides 10 being clamped to the tubes 2 and bent so as to engage the fork of the arms 3, thus limiting the outward movement of the swift arms 3 in the hub tubes 2. The stopper guides 10 are made adjustable to vary the amount of extension of the arms 3.

The holes or passages 4 from each tube 2, communicating with each other inside the hub 1 as described, give an air cushioning or balancing effect to the arms 3 of the swift, and tend to keep the hank running true.

If desired, instead of having holes 4 drilled into the hub, a hole or holes $4^a$ may be provided at the

bottom of each tube 2 (Fig. 4) to let the air escape freely when the arm 3 of the swift is pushed inwards, or the hole or holes 4a may be of such a size that the air in the tube 2 has a cushioning effect on the arm 3 of the swift. This arrangement may be combined with the air compensating communicating passages 4 hereinbefore described.

It is to be understood that the springs in the sockets may be dispensed with.

A swift constructed as hereinbefore described, forms a convenient means for winding cotton, linen, art silk and other textile yarns on to bobbins. Different sizes of hanks may be used, and the swift is especially suitable for winding fine counts and deniers. A hank or yarn is easily placed on the swift, the arms being pushed inwards against the resilient means by a light touch of the attendant's hand, the link motion bringing in the arms in unison, and then the bobbin and hank, the arms fly out instantly and in unison, thus tightening up the hank. It is found in practice when only a few rounds or circuits of yarn are to be run off (i. e. the last 20/60 yards say) in the old style of swift with fixed arms, the yarn commenced to slip and caused a tangle, but with our swift the arms keep the last circuits taut so that there are no tangles and consequently no waste.

A swift as described, does not accumulate fluff very easily, as the circular parts used in its construction do not hold the fluff, which becomes dirty and oily, thereby oiling the yarn, the oil showing up in the bleaching processes.

The arms carrying the hank supports should each be balanced in weight to ensure the hanks running truly.

It should be noted that a convenient construction would be to cast the swift hub and the sockets in one for cheapness and lightness.

We claim:—

1. A hank holder for winding machines comprising, a hub, radial tubes on said hub, a piston member in each tube, hank-supporting means on the outer end of each piston, an enclosed space at the inner end in each tube, resilient means in each space for resisting inward movement of the corresponding piston, interconnecting conduits between said spaces, and coupling means between said pistons so that they move in or out in unison.

2. A hank holder for winding machines comprising, a hub, radial tubes mounted on said hub, a plunger member in each tube, hank-supporting forks on the outer end of each plunger, an enclosed air space at the inner end in each tube, interconnecting conduits in said hub for said air spaces, a rotatable member on said hub, connecting links between each fork and said rotatable member so that said member rotates as the forks move in or out, and stop means on said hub for limiting the rotational movement of said rotatable member.

3. A hank holder for winding machines comprising, a hub, radial sockets on the hub, a plunger member in each socket, hank-supporting means on the outer end of each member, an enclosed air space at the inner end in each tube, interconnecting conduits between said spaces, and spring means in said spaces for urging said arms outwards.

4. A hank holder for winding machines comprising, a hub, radial tubes mounted on the hub, a plunger member in each tube, hank-supporting means on the outer end of each member, an air space at the inner end in each tube, orifices in said tubes connecting said spaces with the atmosphere, and spring means for urging said arms outwards.

5. A hank holder for winding machines comprising, a hub, radial tubes mounted on the hub, a plunger member in each socket, hank-supporting means on the outer end of each member, an enclosed air space at the inner end in each tube, small openings in said tubes connecting said spaces with the atmosphere in order to constitute dash pots for said plungers, and stop means to limit the outward movement of said forks.

6. A hank holder for winding machines comprising, a hub, radial tubes mounted on the hub, a plunger member in each tube, a hank-supporting fork on the outer end of each plunger member, a dash pot at the inner end in each tube, and stop means attached to each tube and lying in the path of the corresponding fork in order to limit the outward movement of same.

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