

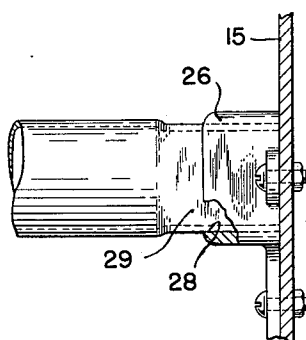
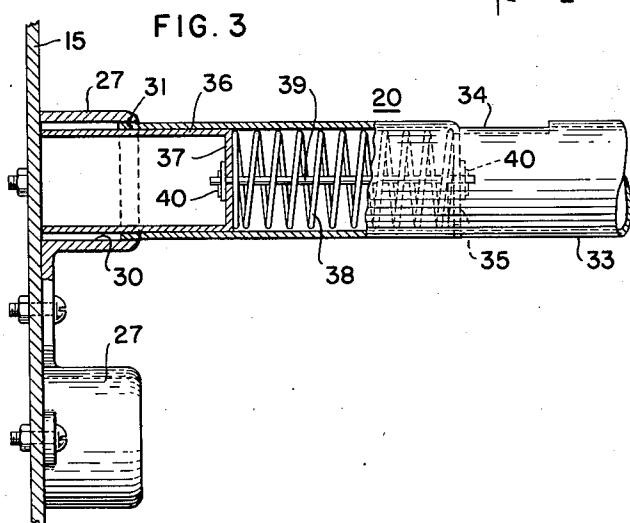
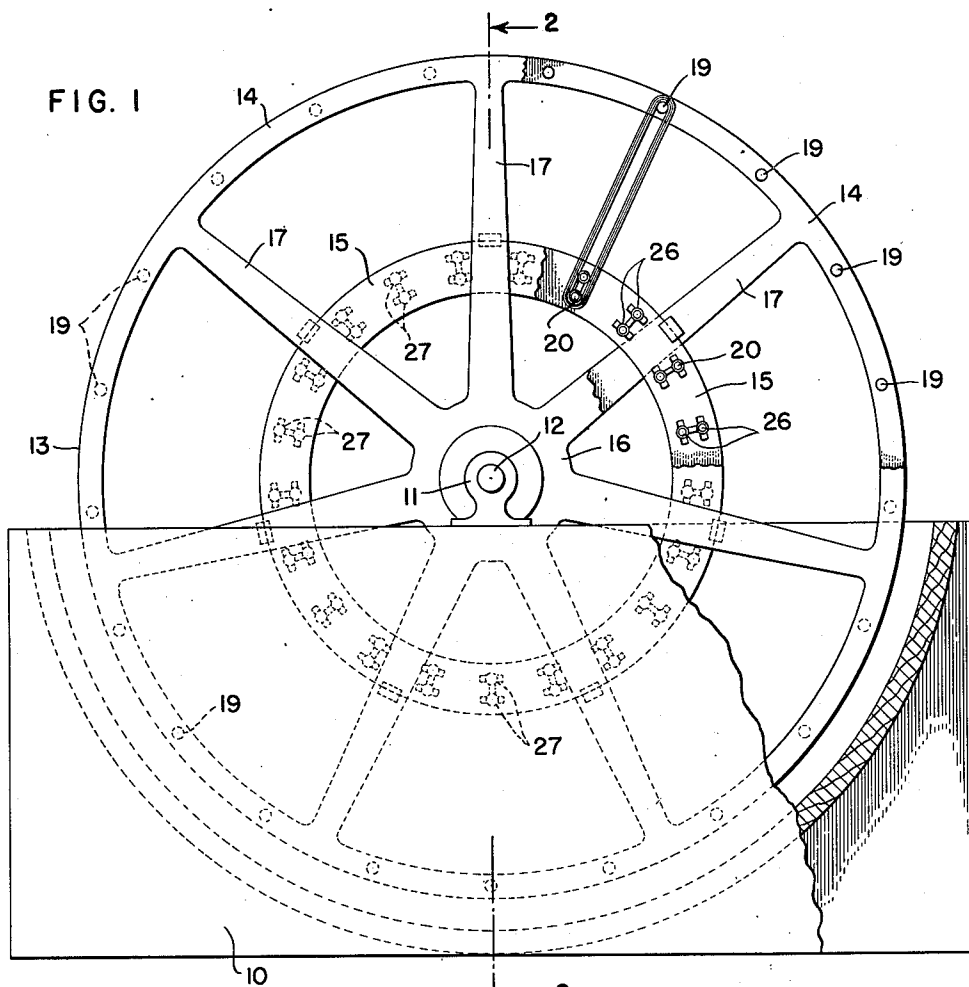
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DYEING APPARATUS

2,611,258

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2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

FIG. 2

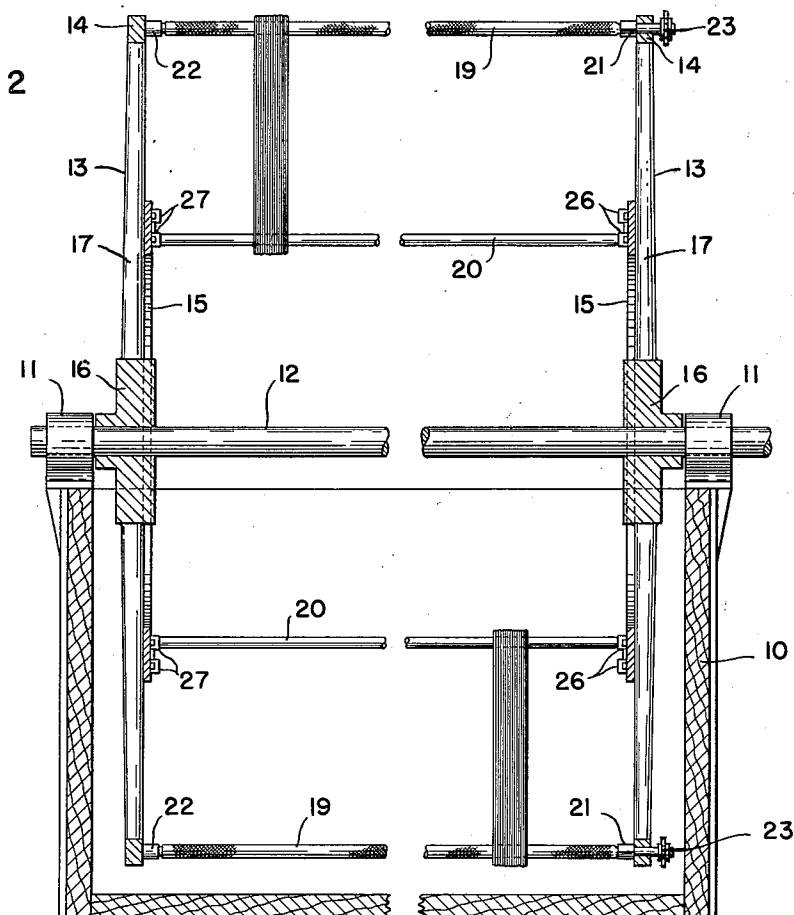
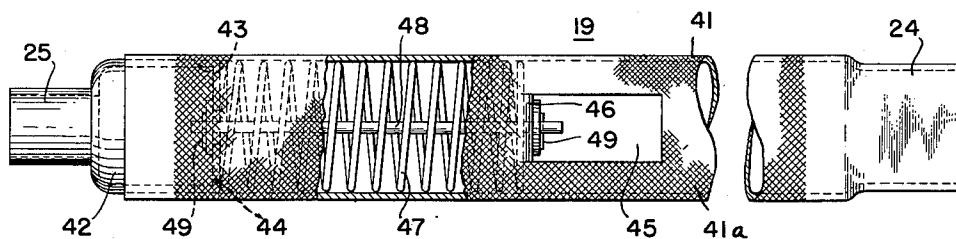


FIG. 4



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DYEING APPARATUS

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2 Claims. (Cl. 68—199)

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This invention relates to dyeing apparatus.

In dyeing apparatus of the Klauder-Weldon type heretofore available, and particularly by reason of the nature of the dye baths employed, considerable difficulty has been encountered with the supporting sticks and their mountings.

It is the principal object of the present invention to provide dyeing apparatus having improved supporting sticks for carrying the skeins and the mountings therefor.

It is a further object of the present invention to provide improved dyeing apparatus in which the yarn supporting rods or sticks have provisions for locking in position.

It is a further object of the present invention to provide dyeing apparatus in which the insertion and removal of the skein supporting sticks or rods will be greatly facilitated.

It is a further object of the present invention to provide improved supporting rods or sticks for carrying the yarn for dyeing which will have a longer life than the sticks now available and which will not damage the yarn during dyeing.

Other objects and advantageous features of the invention will be apparent from the specification and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a side elevational view of dyeing apparatus in accordance with the present invention, parts being broken away to show the details of construction;

Fig. 2 is a vertical sectional view taken approximately on the line 2—2 of Fig. 1;

Fig. 3 is a transverse view, enlarged, partly in vertical section and partly in elevation, illustrating one of the supporting rods or sticks employed in connection with the present invention and the mounting thereof; and

Fig. 4 is a transverse view partly in elevation and partly in section illustrating another of the supporting rods or sticks employed in connection with the present invention.

Like numerals refer to like parts throughout the several views.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of the invention.

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Referring now more particularly to Figs. 1 and 2 of the drawings, a vat or tank 10 is provided having bearings 11 for carrying a shaft 12 upon which a pair of spaced spiders 13 are mounted. Each of the spiders 13 includes an outer ring or rim 14, an inner ring or rim 15 and a hub 16, with radially disposed spokes 17. Extending between and carried by the outer rings or rims 14, a plurality of outer sticks or supporting rods 19 are provided, and extending between and carried by the inner rings or rims 15, a plurality of inner sticks or supporting rods 20 are provided, each stick 19 having a corresponding stick 20 disposed in the same radial plane through the shaft 12.

One of the outer rings 14 is provided, at spaced locations around the inner surface thereof which faces the inner surface of the other ring 14, with sockets or cups 21, the sockets 21 being rotatable in any desired manner such as by means of the star wheels 23. The sockets 21 are preferably of square conformation in the interior for the reception of square ends 24 of the outer sticks or supporting rods 19.

The other of the outer rings 14 is preferably provided with corresponding sockets or cups 22, of round interior shape, for the reception of the round ends 25 of the rods or sticks 19.

One of the inner rings 15 is provided, at spaced locations around the inner surface thereof, with sockets or cups 26 in pairs, each of the sockets 26 of each pair being in radial alignment with one of the sockets 21 on the corresponding outer ring or rim 14.

The other of the inner rings 15 is also provided with corresponding sockets or cups 27 in pairs, in radial alignment with one of the sockets 22 of the outer ring 14.

The sockets 26 preferably have interior openings 28 of square conformation for the engagement of square ends 29 of the inner sticks or supporting rods 20 and the sockets 27 on the inner ring opposite thereto preferably have interior openings 30 of round conformation for the engagement of round ends 31 of the inner sticks or supporting rods 20.

The provision of the sockets 26 and 27 in pairs on the inner rings 15 permits of mounting skeins of different lengths as desired.

A preferred construction of the inner supporting rod or stick 20 is shown in Fig. 3.

Each rod or stick 20, and the constituent parts thereof, is preferably of a suitable material resistant to the action of the dye bath and may be of stainless steel or the like. The stick or rod

20 preferably comprises an elongated cylindrical hollow tubular central portion 33 with a square end 29, as heretofore indicated. The tubular portion 33 at the other end is preferably slotted, as at 34, and a portion 35 of the wall is struck diametrically inwardly with respect to the tubular portion 33 to provide an abutment.

The tubular portion 33 is smaller in length than the distance between the inner rings 15 and has telescoped in the end 31 thereof, opposite the square end 29, a tubular extension 36, the inner end 37 of which also provides an abutment. A compression spring 38 is provided in the interior of the end 31 between the abutment 35 and the end 37 of the telescoping section 36, and a rod 39 extending longitudinally through the spring 38 and having pins 40 at its outer ends provides a limit for the movement of the telescoping section 36 and prevents separation thereof from the tubular portion 33.

A preferred form of outer stick or supporting rod 19 is illustrated in Fig. 4. Each rod or stick 19, and the constituent parts thereof, is preferably made of a suitable material resistant to the action of the dye bath and may be of stainless steel or the like. The rod or stick 19 preferably includes a central section 41 with a square end 24, as heretofore indicated. The exterior surface of the central section 41 is preferably knurled or otherwise shaped to provide a frictional surface 41a for engagement with the skein for effecting rotation of the skein.

At the other end of the central section 41, opposite the end 24, a telescoping section 42 is provided, the outer or free end of which is preferably cylindrical and of reduced diameter and the inner end 43 of which is provided with an abutment 44. The central section 41, at the other end, is preferably slotted as at 45, with a portion 46 transversely or diametrically disposed to provide an abutment. A compression spring 47 is provided in the interior between the abutment 44 and the abutment 46. A rod 48 is provided, extending longitudinally in the interior, and is provided with pins 49 at the outer ends thereof for limiting the outward movement of the telescoping section 42 and preventing the separation thereof from the central section 41.

When it is desired to mount the skeins for dyeing the desired number of skeins are placed side by side on one of the outer rods or sticks 19 which is then positioned with the end 25 in engagement with the socket 22 and the rod or stick 19 pushed towards the end 28 to effect compression of the spring 47. The square end 24 is then seated within its socket 21 and is held therein by expansion of the spring 47. The inner stick 20 is then inserted in the skeins carried on the outer rod or stick 19, the telescoping portion 36 inserted in the proper socket 27, and the stick 20 pushed towards the end 31 to compress the spring 38. The end 29 is then seated in the socket 26 and is held therein by expansion of the spring 38.

The inner stick or supporting rod 20 may be positioned radially inwardly in the desired sockets 26 and 27 in accordance with the length of the skeins in engagement therewith. Successive pairs of outer sticks 19 and inner sticks 20 are loaded with skeins in the same manner. The spiders 13, with the rods 19 and 20 secured thereon, are then rotated by the shaft 12 to bring the skeins

of yarn successively into the dye bath in the manner customary with the Klauder-Weldon machines.

During the rotation of the spiders 13, the star wheels 23 will be effective in the usual manner for rotating the outer sticks 19, step by step, whereby the skeins in engagement therewith are also shifted in their relationship to the inner sticks 20 and the outer sticks 19.

When it is desired to remove the sticks 19 and 20, this may be readily effected by pushing the same towards the round ends 25 or 31 so that the square ends 24 or 29 may be disengaged from their sockets, whereupon the round ends 23 or 31 may also be disengaged.

I claim:

1. In dyeing apparatus, a yarn stick comprising a hollow elongated tubular body, and means for removably mounting said stick comprising fixedly spaced sockets having interior openings for the reception of and engagement with the ends of said tubular body, a stop member at the outer end of each of said sockets, the body of the stick at one end engaging one of said sockets and the stop member at that end and the body of the stick at the other end engaging the socket at that end whereby the load on said body is transferred directly to said sockets, a slidable holding member in telescoping relation to the body at said other end and having an outer terminus in engagement with the stop member at that end and an inner terminus providing an abutment, and a spring in engagement with said abutment for urging said slidable member into engagement with said stop member.

2. In dyeing apparatus, a yarn stick comprising a hollow elongated tubular body, and means for removably mounting said stick comprising fixedly spaced sockets having interior openings for the reception of and engagement by the end portions of said tubular body, one of said sockets having a circular interior and the other a non-circular interior and said body having ends complementary to said sockets, a stop member at the outer end of each of said sockets, the body of the stick at one end engaging one of said sockets and the stop member at that end and the body of the stick at the other end engaging the socket at that end whereby the load on said body is transferred directly to said sockets, a slidable holding member in telescoping relation to the body at said other end and having an outer terminus in engagement with the stop member at that end and an inner terminus providing an abutment, and a compression spring in engagement with said abutment for urging the outer terminus of said slidable member into engagement with said stop member at said end.

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