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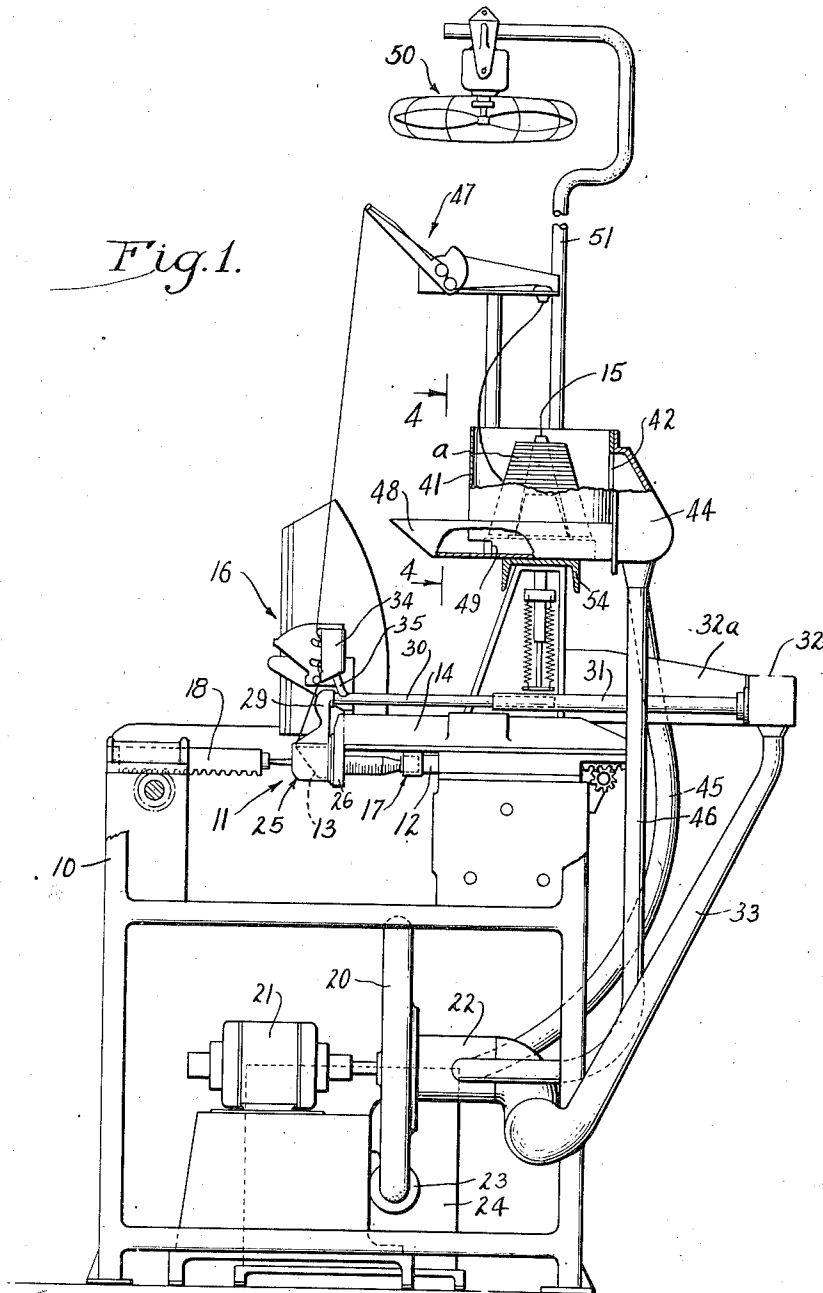
R. P. DRAKE

2,460,736

LINT REMOVAL MEANS FOR BOBBIN WINDING MACHINES

Filed Nov. 22, 1946

2 Sheets-Sheet 1



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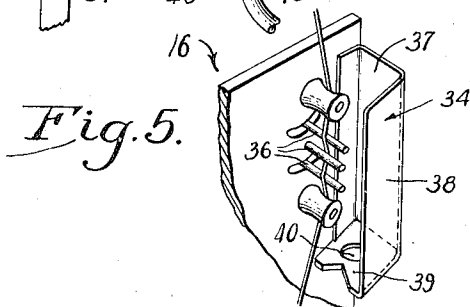
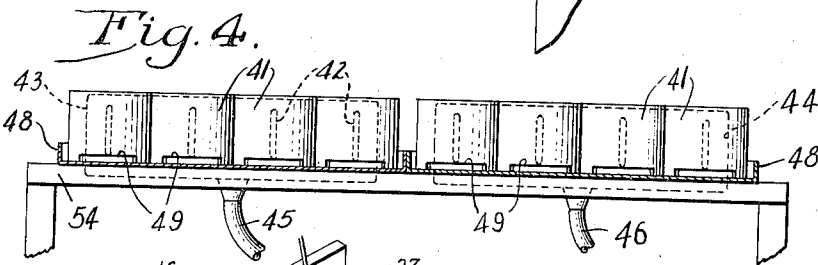
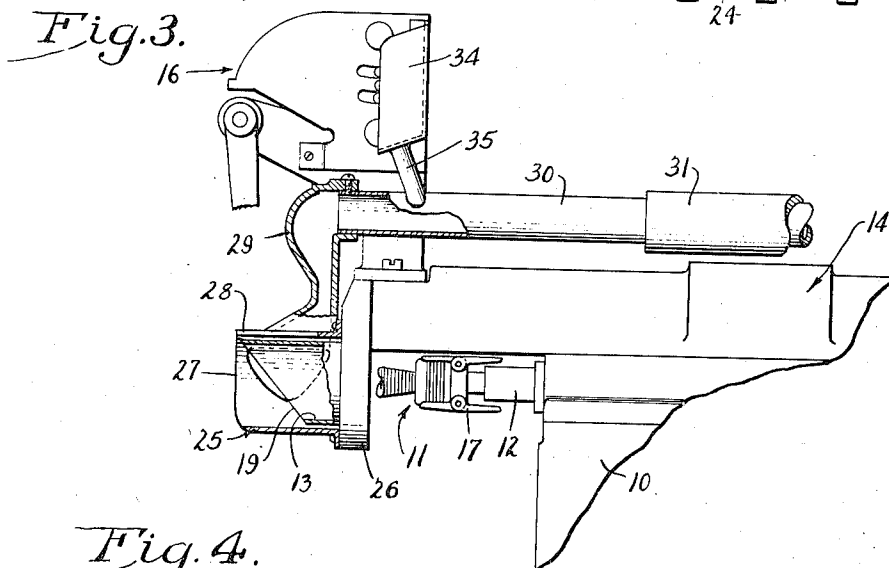
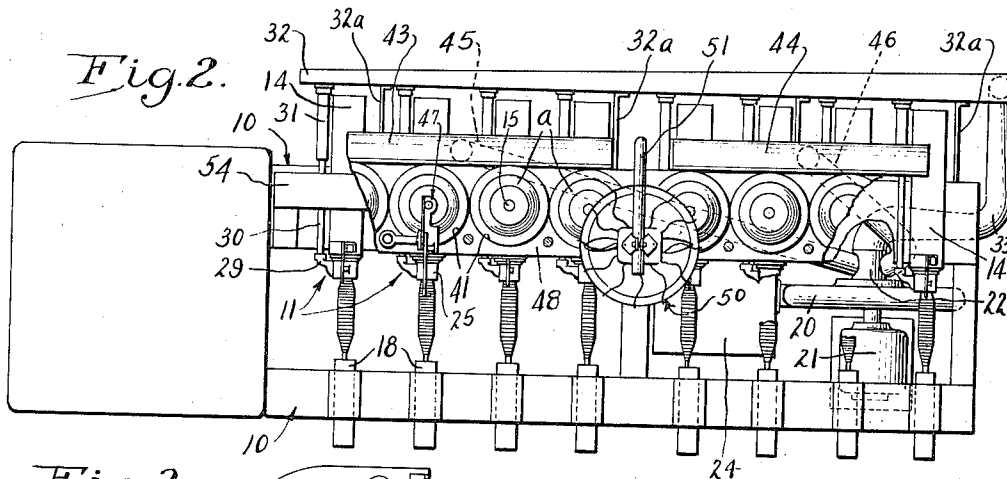
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UNITED STATES PATENT OFFICE

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LINT REMOVAL MEANS FOR BOBBIN WINDING MACHINES

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17 Claims. (Cl. 242—32)

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The invention pertains to bobbin winding machines of the type comprising a plurality of laterally spaced winding units each comprising means for rotatably supporting the bobbins to be wound, a yarn traversing device movable axially of the bobbin during the winding operation, a support for a yarn mass constituting a source of supply of yarn to be wound, and a yarn tensioning device through which the yarn passes into operative association with the traversing device; and the invention especially concerns an exhaust system by which lint produced at each of said units as an incident to the travel of the yarn at high speed from its sources of supply to the bobbin is effectually removed so as to avoid periodic interruptions in the operation of the machine as well as to insure that accumulations of lint shall not be deposited upon and incorporated in the yarn mass being wound.

The object of the invention thus generally set forth, together with other and ancillary advantages, is attained by the construction and arrangement shown by way of illustration in the accompanying drawings, in which:

Figure 1 is a fragmentary side elevational view of a bobbin winding machine equipped with an exhaust system embodying my invention.

Fig. 2 is a fragmentary plan view of such a machine.

Fig. 3 is a side elevational view with portions in section, showing on a somewhat enlarged scale a winding spindle and its associated traversing and yarn tensioning devices, and illustrating in particular the collection of lint from these devices.

Fig. 4 is a fragmentary vertical section taken approximately in the plane of line 4—4 of Fig. 1.

Fig. 5 is a fragmentary perspective view showing the collection of lint from the yarn tensioning device.

The improved lint exhaust system is herein shown for purposes of illustration embodied in a bobbin winding machine of the general character disclosed and claimed in Marcellus Patent No. 2,409,639, issued October 22, 1946. Generally stated, it comprises a horizontally elongated frame 10 having mounted thereon in laterally spaced relation a series of winding units generally designated 11. Each unit comprises means rotatably supporting a bobbin to be wound and including a horizontally disposed winding spindle 12; a traversing cam 13 encircling the bobbin and mounted upon a slide 14 for movement axially of the bobbin; a supporting means 15 for

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a yarn mass *a* constituting a source of supply for the yarn to be wound upon the bobbin; and a yarn tensioning device 16 also supported on the slide 14 and through which the running strand passes into operative association with the traversing cam. The winding spindle 12 is equipped with a chuck 17 for gripping the butt end of the bobbin, the opposite or tip end of the bobbin being supported by a centering slide 18. In the winding operation, the traversing cam is rotated unidirectionally. It has a leading spiral cam surface 19 engaging with the yarn to effect a traversing thereof through a relatively short stroke axially of the spindle while the cam is advanced continuously along the spindle thereby producing a filling wound bobbin. The means for rotating the spindle and the traversing cam is not shown. It may be of the character disclosed in said Marcellus application.

The machine is intended for operation at high speed and it will accordingly be evident that the engagement of the running strand with the traversing cam 13 is productive of a substantial amount of lint. Similarly, in unwinding the yarn from the yarn mass *a* the yarn whips rapidly about the yarn mass so that the lint is produced in substantial volume at this point. Finally in the passage of the yarn through the yarn tensioning device 16, a substantial amount of lint is created. In carrying out my invention, I provide for the effectual withdrawal of lint at the three points referred to.

The exhaust system comprises, in general, a suction fan 20 driven by an electric motor 21 and having an intake chamber 22 and an outlet duct 23, the latter discharging into a collector 24. The fan and collector are designed for incorporation in the lower portion of the machine frame, and the intake chamber 22 is connected with the several points at which the lint is produced as will presently appear.

Referring now to Fig. 3 of the drawings, a hood 25 herein in the form of a cylinder is mounted on the traverse slide 14 through the medium of a depending support 26 constituting a casing for enclosing the gearing by which the traversing cam is driven. The cylinder is closed at its rear end by the support 26 and is open at its forward end as indicated at 27. Its upper side is slotted as at 28 for the passage of the yarn into operative association with the cam surface 19.

Overlying the cylinder 25 and communicating therewith at one side thereof is a hollow mem-

ber 29 opening rearwardly into an exhaust tube 30 having a telescoping fit in a stationary exhaust pipe 31 terminating at its rear end in a manifold 32 extending lengthwise of the machine rearwardly of the units. This manifold is stationarily supported on the machine frame by brackets 32a. At one end, the manifold is connected by a pipe 33 to the intake chamber 22 of the exhaust fan 20, and as seen in Fig. 2 the manifold tapers toward the opposite end so as to equalize the suction on the hoods or cylinders 25. It will be understood that the telescoping connections between the tubes 30 and pipes 31 permit of axial movement of the hoods or cylinders 25 and their associated members 29 during the winding operation.

For the collection of lint produced by the passage of yarn through the yarn tensioning device 16, I provide a hood 34 having an outlet conduit 35 terminating at its lower end in the exhaust tube 30. The tensioning device comprises as in conventional devices of this type a plurality of parallel rods or fingers 36, one of which is stationary and the others movable. Because convenient access to the device is desirable, the hood 34 is in the form of a generally U-shaped member (Fig. 5) opening forwardly and comprising a rear wall 37, end walls 38 and a bottom wall 39. The latter has an opening 40 communicating with the outlet conduit 35.

Lint produced in the unwinding of the yarn from the yarn mass *a* is collected and withdrawn by means including a hood 41, one for each yarn mass, and one or more exhaust manifolds. Each hood is in the form of a cylindrical casing (Fig. 1) of a diameter somewhat larger than the yarn mass *a* and having a vertically elongated opening 42 in its rear side. As shown in Fig. 2, two exhaust manifolds 43 and 44 are provided, each serving a group of four winding units. Each of the hoods or casings 41 communicates through its rear opening 42 with its corresponding manifold, and the two manifolds are respectively connected to the fan exhaust chamber 22 by means of exhaust pipes 45 and 46 opening into the bottoms of the manifolds substantially centrally thereof. Each of the casings 41 opens upwardly to permit of easy insertion and removal of the yarn mass *a*, the running strand passing upwardly through this open end of the casing whence it passes to an equalizing device generally designated 47 before passing downwardly to the yarn tensioning device 16. To collect stray lint in the region about the yarn masses *a*, I preferably provide an elongated tray 48 for each group of four hoods 41. These trays are interposed between the hoods 41 and the supporting frame bar 54 upon which the casings are mounted. The trays extend lengthwise of the machine and also forwardly some distance beyond the casings 41. Accumulations of lint deposited in the tray are withdrawn into the casings through openings 49 in the lower forward portions thereof and thence to the manifolds 43 and 44. To facilitate movement of the lint collecting in the tray 48 into the openings 49, a conventional oscillating fan 50 is mounted above the machine substantially centrally thereof on a bracket 51.

It will be seen that the hoods 25, 34 and 41 are constructed and connected to the exhaust system so as not to interfere with the normal operation of or access to the devices with which the hoods are respectively associated. The location of the exhaust fan and lint collector in the base of the machine is advantageous because no additional

floor space is required for their accommodations.

I claim as my invention:

1. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement in a direction lengthwise of the bobbin and adjacent thereto, a yarn traversing device mounted on said support, yarn supply means including a support for a yarn mass, and a tensioning device through which a strand of yarn leading from said yarn mass passes into operative association with the traversing device; the combination of lint removing means comprising an upwardly opening hood enclosing the yarn mass laterally thereof, hoods partially enclosing said yarn tensioning device and said yarn traversing device respectively, and an exhaust system connected with the respective hoods and operative to withdraw lint accumulating therein.

2. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement in a direction lengthwise of the bobbin and adjacent thereto, and yarn traversing and yarn tensioning devices mounted on said support; lint exhaust means comprising a hood associated with each of said devices, and an exhaust system connected with the respective hoods and operative to withdraw lint accumulating therein.

3. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement in a direction lengthwise of the bobbin and adjacent thereto, and yarn traversing and yarn tensioning devices mounted on said support; lint removing means comprising a hood partially enclosing said yarn tensioning device and a second hood associated with said traversing device, and an exhaust system including a stationary exhaust pipe and an exhaust tube communicating with the respective hoods and having a telescoping connection with said stationary pipe.

4. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement in a direction lengthwise of the bobbin and adjacent thereto, yarn traversing and yarn tensioning devices mounted on said support; lint removing means comprising a stationary exhaust pipe, an exhaust tube having a telescoping fit with said pipe, a hood at least partially encircling said yarn tensioning device and having an outlet conduit connected with said discharge tube, and a hood at least partially encircling said yarn traversing device and connected with said tube for the passage of lint thereto.

5. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement axially of the bobbin, a yarn tensioning device mounted on said support, a hood at least partially enclosing said yarn tensioning device, and an exhaust system connected with said hood for the removal of lint therefrom and including a manifold, and a discharge conduit connected with said hood and having an extensible connection with said manifold.

6. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement in a direction lengthwise of the bobbin and adjacent thereto, yarn traversing and tensioning devices mounted on said support for movement therewith, and means for exhausting lint produced adjacent each

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of said devices comprising a stationary exhaust pipe and an exhaust tube movable with said support and having a telescoping pipe connection with said pipe.

7. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement lengthwise of the bobbin, a cylindrical yarn traversing cam mounted on said support in encircling relation to the bobbin, a hood also mounted on said support and encircling said traversing cam, and an exhaust system connected with said hood for the removal of lint therefrom.

8. In a bobbin winding machine having means for rotatably supporting a bobbin to be wound, a support mounted for movement longitudinally of the bobbin, a cylindrical yarn traversing cam mounted on said support in encircling relation to the bobbin, a hood also mounted on said support and encircling said traversing cam, and an exhaust system connected with said hood for the removal of lint therefrom comprising a stationary manifold, a hollow member having one end opening into said hood, and an extensible pipe connection between the other end of said member and said manifold.

9. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support movable lengthwise of the bobbin, a cylindrical traversing cam mounted on said support and encircling the bobbin, a hood enclosing the traversing cam laterally thereof and open at its forward end, said hood having a slot in one side for the passage of yarn into operative association with the traversing cam, a hollow member mounted on said support and communicating with said hood through said slot, and an exhaust system connected with said member.

10. In a bobbin winding machine having means supporting a bobbin for rotation on a horizontal axis, a support movable lengthwise of the bobbin, a traversing cam rotatably mounted on said support and encircling the bobbin, means for supporting a yarn mass above the bobbin in vertically spaced relation thereto, and means for collecting and removing lint formed adjacent the traversing device including a hood enclosing the traversing cam laterally thereof and open at its forward end, said hood having a slot in its upper side for the passage of yarn from the yarn mass to the bobbin with the strand disposed in operative association with the traversing cam, and an exhaust member communicating with said hood through said slot.

11. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement axially of the bobbin, a yarn traversing device mounted on said support, a yarn tensioning device also mounted on said support, a hood enclosing said yarn tensioning device and comprising a generally U-shaped member having a bottom wall, a discharge conduit opening into said bottom wall, and an exhaust system connected with said conduit for the removal of lint from the hood.

12. In a bobbin winding machine having means rotatably supporting a bobbin to be wound, a support mounted for movement lengthwise of the bobbin, a yarn tensioning device mounted on said support and comprising a plurality of parallel fingers through which the running strand

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passes on its way to the bobbin, a U-shaped member mounted on said support and partially enclosing said device so as to expose said fingers, and an exhaust system connected with said member for removal of lint therefrom.

13. In a bobbin winding machine comprising a frame, means rotatably supporting a bobbin to be wound, means on said frame for supporting a yarn mass, an upwardly opening hood encircling the yarn mass, and lint removing means including a hollow member disposed at one side of said hood and communicating therewith and an exhaust system connected with said hollow member.

14. In a bobbin winding machine having a frame, a series of winding units spaced apart lengthwise of the frame and each having means rotatably supporting a bobbin to be wound, and means supporting a yarn mass for supplying yarn to the bobbin; an upwardly opening hood encircling the yarn mass, a manifold extending longitudinally of the frame and communicating with the respective hoods, and lint removing means connected with said manifold.

15. In a bobbin winding machine having an elongated frame, means for supporting a plurality of yarn masses in spaced relation along the frame with the yarn masses disposed on vertical axes, an upwardly opening hood encircling each of the yarn masses, a tray underlying said hoods and extending forwardly therefrom, said hoods having openings at their lower ends adjacent the tray, and exhaust means including a manifold communicating with the several hoods at one side thereof.

16. In a bobbin winding machine having an elongated frame, means for supporting a plurality of yarn masses in spaced relation along the frame with the yarn masses disposed on vertical axes, an upwardly opening hood encircling each of the yarn masses, a tray underlying said hoods and extending forwardly therefrom, said hoods having openings at their lower ends adjacent the tray, exhaust means including a manifold communicating with the several hoods at one side thereof, and a fan for directing a current of air downwardly upon said tray.

17. In a bobbin winding machine comprising an elongated frame, a series of winding units disposed in laterally spaced relation lengthwise of the frame and each comprising means for supporting a bobbin to be wound for rotation on a horizontal axis and means supporting a yarn mass above the bobbin; lint collecting hoods operatively associated with the bobbin and with the yarn mass of each unit, manifolds extending longitudinally of the frame and connected with said lint collecting hoods, an exhaust fan positioned in the frame below said winding units, and means connected with said manifolds and leading to said exhaust fan for the delivery of lint thereto.

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