Aug. 30, 1966 R. M. BELL ETAL 3,269,152

DYEING MACHINE

Filed Aug. 24, 1964 3 Sheets-Sheet 1

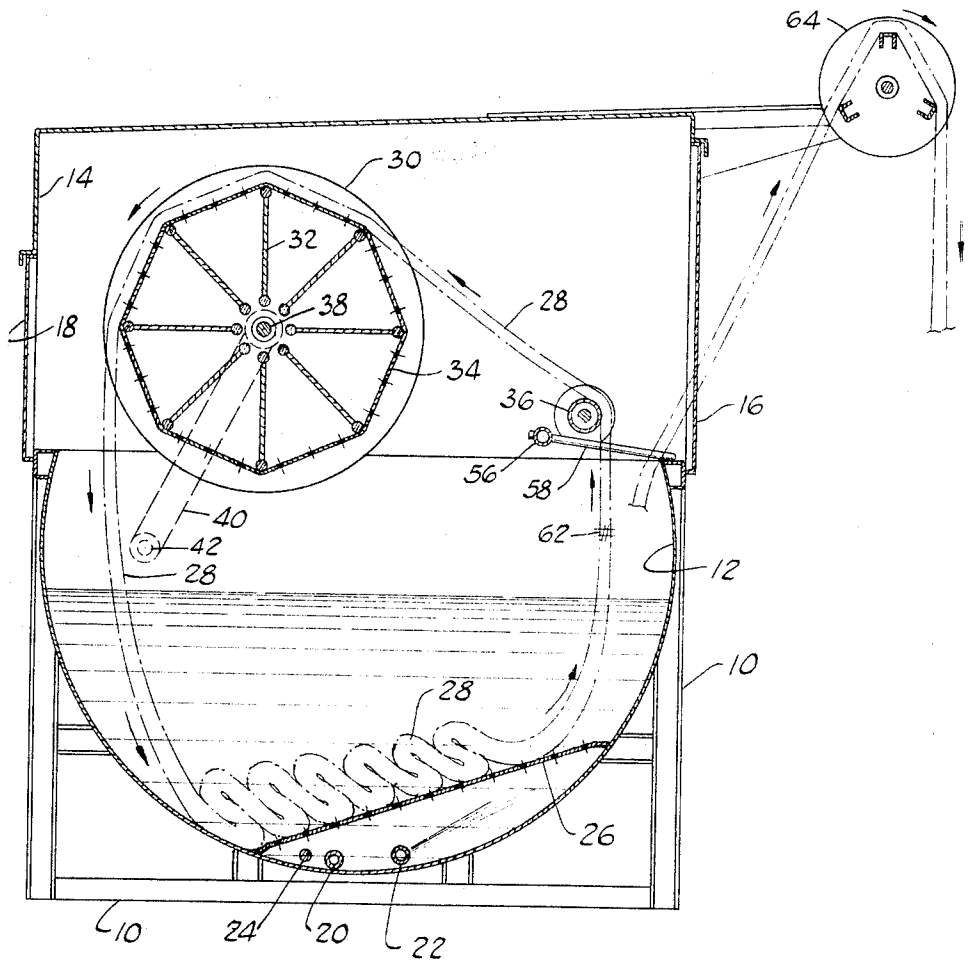


Fig-1

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DYEING MACHINE

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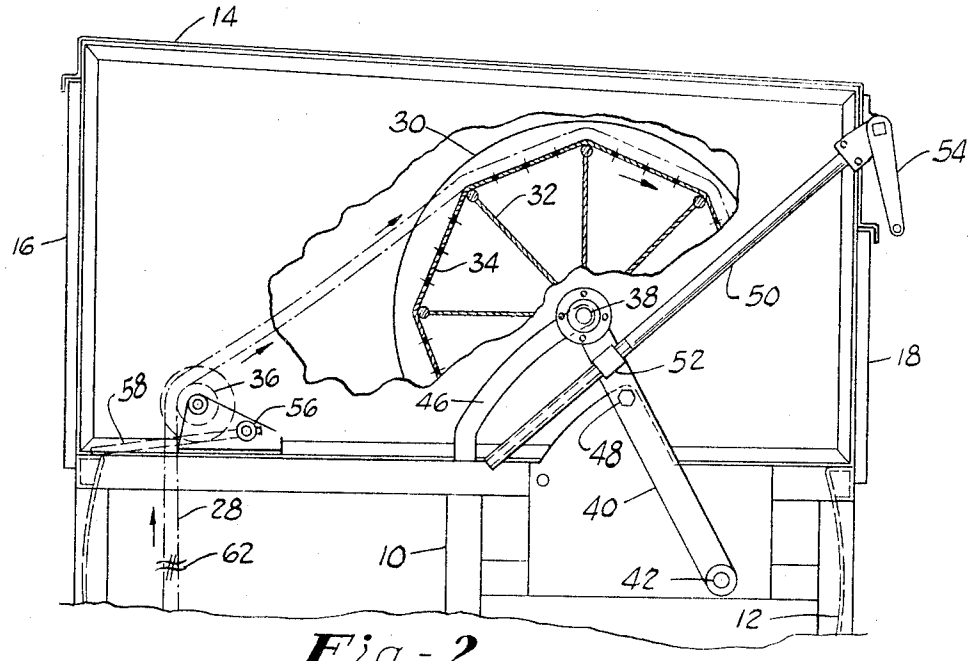


Fig - 2

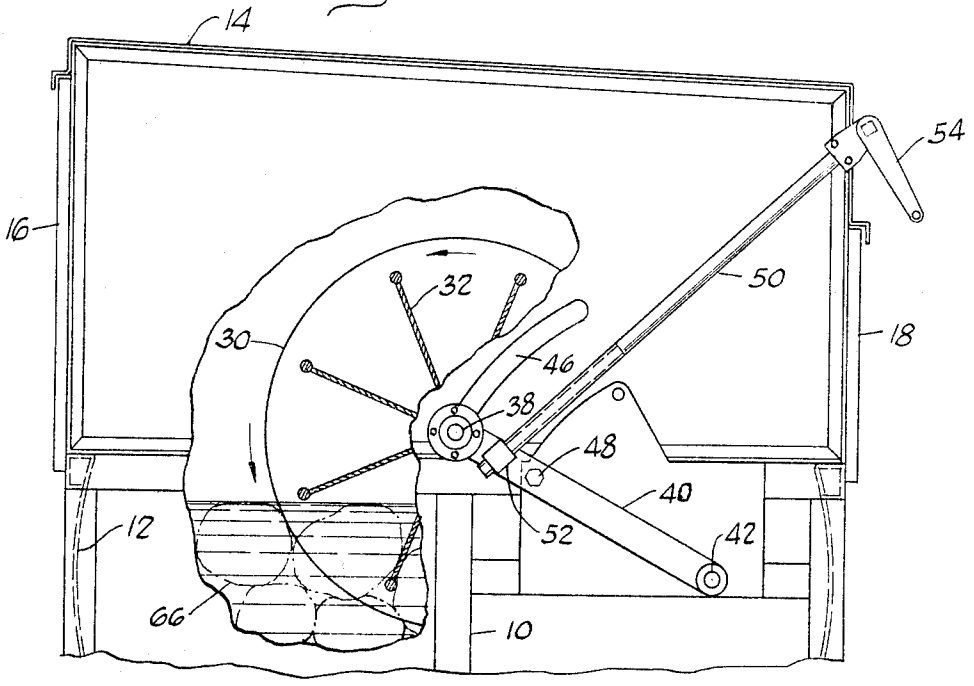


Fig - 4

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DYEING MACHINE

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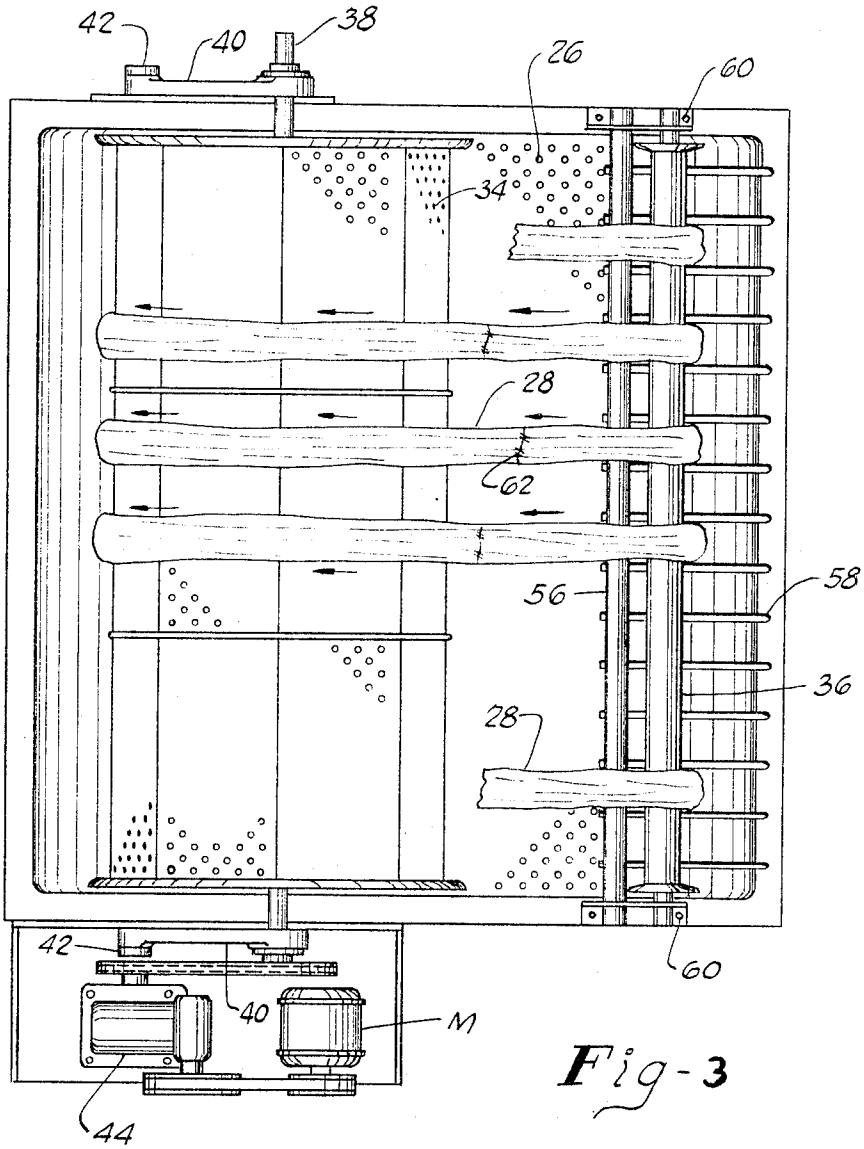


Fig-3

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3,269,152

DYEING MACHINE

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Filed Aug. 24, 1964, Ser. No. 391,458
10 Claims. (Cl. 68—4)

This invention relates to a dyeing machine of the type used for dyeing various types of fabric.

One object of the invention is to produce an improved machine of the type set forth.

A further object is to produce an improved dyeing machine which can be interchangeably used for dyeing continuous material, such as tubular or flat knit fabrics and the like, as well as non-continuous material, such as socks, sweaters and the like.

A still further object is to produce a dyeing machine which can be converted from one use to another by the installation, or removal, of a minimum number of parts which are constructed and arranged for easy mounting and installation.

The full nature of the invention will be understood from the following specification and the accompanying drawings in which

FIG. 1 is a vertical sectional view of a dyeing machine embodying this invention, the machine being shown ready for use in dyeing continuous material.

FIG. 2 is a slightly enlarged vertical sectional view of the upper portion of the machine, the view being taken on a vertical plane spaced from the vertical plane of FIG. 1.

FIG. 3 is a top plan view of the machine with the cover removed to show the internal structure.

FIG. 4 is similar to FIG. 2 but showing the machine adapted for use in dyeing non-continuous material.

The machine illustrated in FIGS. 1 to 3 includes a supporting frame **10** which carries a vat **12** and also supports an upper casing **14** which coacts with vat **12** to enclose the parts of the machine later on described. Upper casing **14** is provided with vertical sliding end doors **16** and **18** which are moved downwardly to afford access to the interior of the upper casing and vice versa. The vat **12** is provided with a pipe **20** for supplying the dye liquor to be used and with a pipe **22** for supplying steam. The temperature can be automatically regulated by conventional means, not shown, in response to the temperature of thermometer bulb **24**. The supply of dye and steam is also controlled by conventional means, not shown. The vat is also provided with a perforated false bottom **26** which preferably slants, as shown in FIG. 1, and which serves to support the folds of an endless loop **28** of material to be dyed. The loop **28** of material to be dyed passes over, and is propelled, in the direction of the arrows shown in FIG. 1, by a wheel **30** which comprises radial paddles **32** on which is detachably mounted a perforated drum **34** which may be circular or polygonal. It will be noted that the material loop **28** also passes over an idler roll **36**. Wheel **30** is carried by shaft **38** the opposite ends of which are journalled in arms **40** which are pivoted at **42**. Shaft **38** is driven by a conventional motor M and conventional variable speed drive **44**. The opposite ends of shaft **38** are adapted to move in slots **46**, which are provided in the opposite side frame members of the machine so as to permit movement of wheel **30** to the uppermost position of FIG. 2, or to the lowermost position of FIG. 4, or to any position in between, for the purpose hereinafter set forth. Arms **40** may be locked in any position to which it may have been moved by means of locking pins **48**. Wheel **30** is raised or lowered,

by means of lift screws **50** which engage threaded nuts **52** on arm **40** and which are rotated by cranks **54**.

In order to confine each loop to a separate path, we provide a rail **56**, FIGS. 1 and 4 which carries parallel pins **58** each pair of which defines a guide space through which a loop **28** passes, FIG. 3.

Roller **36** and rail **56** are clamped in position by suitable journal brackets which are secured to the frame by screws **60** or the like so that they may be readily installed or removed.

The operation of the machine thus far described is as follows:

With doors **16** and **18** lowered, the material to be dyed, such as piece goods, is passed over drum **34**, over idler roll **36**, and between a pair of pins **58** and its ends are stitched as at **62** to form the endless loop **28** previously referred to. When drum **34** has been loaded to the desired extent, the motor is turned on to propel loop **28** in the direction of the arrows so as to immerse successive portions of the endless loop in the dye liquor. The length of time during which any portion of the loop is immersed can be controlled by the speed of rotation of wheel **30**, by the level of the liquor in the vat, and by the position of wheel **30** relative to the level of the liquor. For example, by slowing the rotation of wheel **30**, the immersed portions of the loops will take longer to pass through the vat. The same result can be obtained by lowering wheel **30** or by raising the level of the liquor in the vat.

When the dyeing operation has been completed, stitches **62** are removed and the end of a loop is pulled out and passed over a suitably driven take-out roll **64** to withdraw the material out of the vat.

When it is desired to dye non-continuous goods, such as garments and the like, drum **34** is removed; batches **66** of the goods to be dyed are placed in the liquor and wheel **30** is lowered to the desired position, FIG. 4, at least partly to immerse the paddles **32** in the dye liquor whereby rotation of wheel **30** causes the paddles to push goods **66** through the dye.

From the foregoing it will be seen that as illustrated in the drawings, the apparatus can be used for dyeing endless, or looped goods and that, by removing drum **34**, with, or without removing rail **56** and idler **36**, the apparatus is instantly converted for use in dyeing batch goods.

What we claim is:

1. A dyeing machine including:
a vat adapted to contain dye liquor,
a wheel,
means mounting said wheel for movement to a first position remote from, and to other positions closer to, the level of the liquor in the vat,
means for retaining said wheel in any of said positions,
means for rotating said wheel,
and means carried by said wheel for supporting and propelling the goods to be dyed.

2. The machine defined in claim **1** and an idler roll spaced from said wheel and engageable by said goods.

3. The machine defined in claim **1** in which said wheel includes radial paddles which when said wheel is in a lower position are immersed in the liquor.

4. The machine defined in claim **3** and a perforated drum detachably mounted on said paddles.

5. The machine defined in claim **1** and a plurality of spaced fingers providing guide spaces therebetween providing separate paths for movement of the goods to be dyed into the liquor.

6. The machine defined in claim **2** in which said idler roller is detachably secured.

7. The machine defined in claim **2** in which said fingers are detachably secured.

8. A machine selectably usable for dyeing a material

in endless loop form and in batch form, said machine including:

a vat for containing the dye liquor,

a wheel,

paddles carried by said wheel,

means mounting said wheel for vertical movement relative to the level of the dye liquor in said vat,

adjustable means for moving said wheel to, and keeping in a lower position in which said paddles are immersed enough to engage and propel a batch of web through the dye liquor,

a drum for supporting a continuous loop of web,

means for detachably mounting said drum on said paddles for converting said machine from batch to continuous loop dyeing, and

means for rotating said drum.

9. The machine defined in claim **9** and auxiliary guide means detachably secured adjacent the top of said vat and engageable by said loop.

10. The machine defined in claim **9** in which said guide means includes an idler roll.

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