

Jan. 4, 1966

J. WAGNER

3,227,134

APPARATUS FOR THE DISTINGUISHING OR MARKING OF SPINNING COFS

Filed Jan. 15, 1963

4 Sheets-Sheet 1

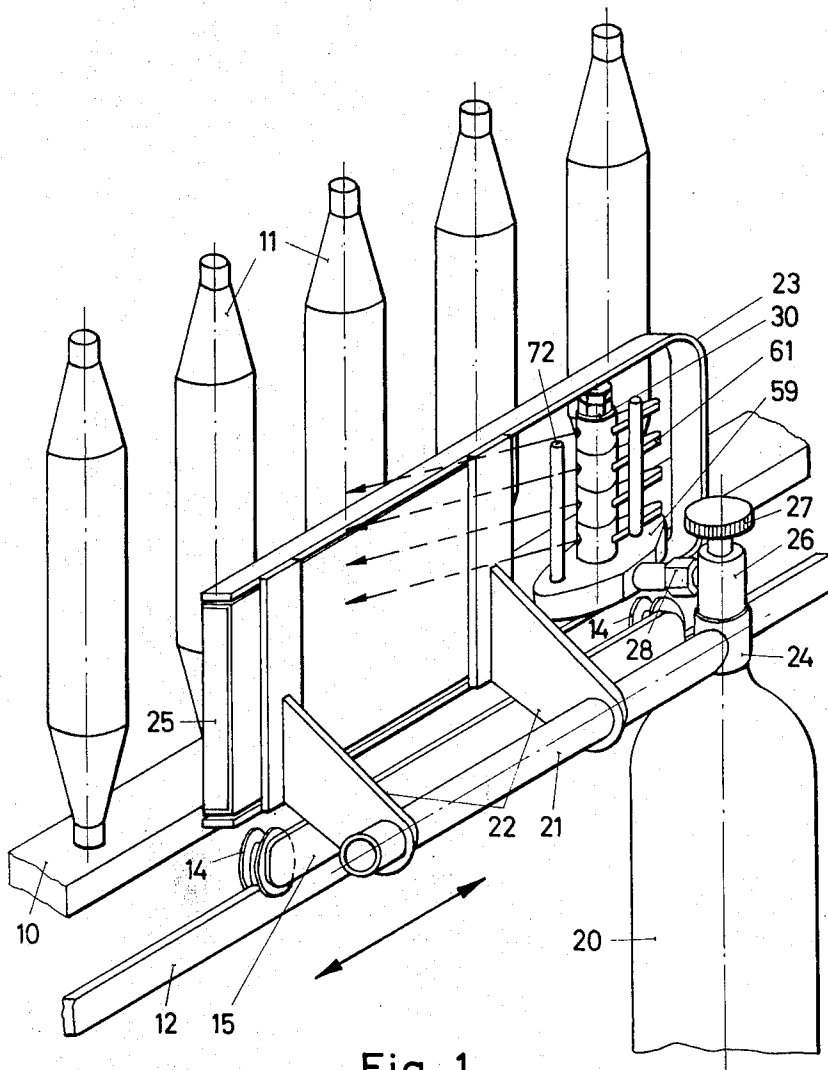


Fig. 1

INVENTOR.

JOSEF WAGNER

BY

BY
Moore, Hall & Pollock
ATTORNEYS

ATTORNEYS

Jan. 4, 1966

J. WAGNER

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4 Sheets-Sheet 2

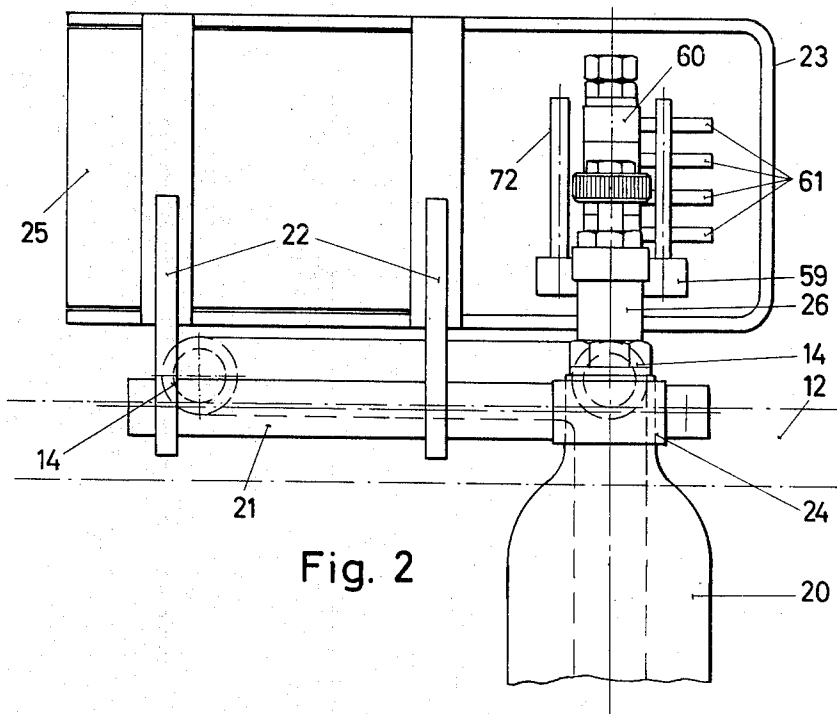


Fig. 2

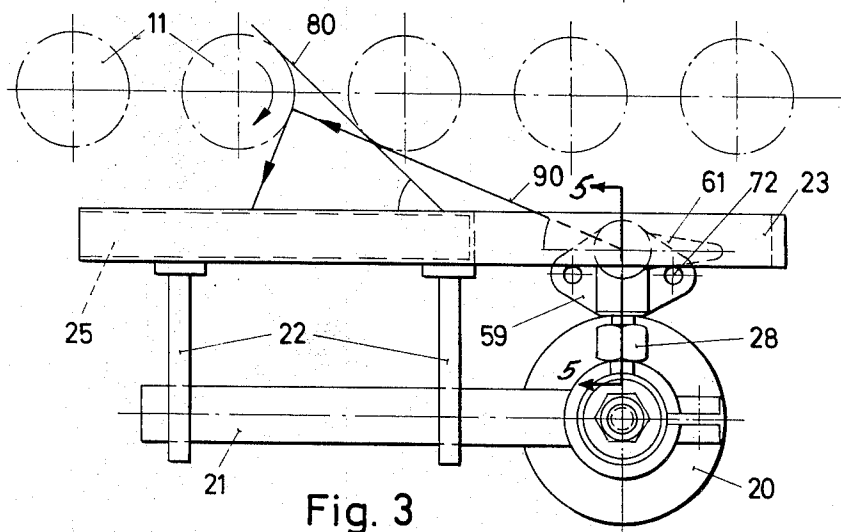


Fig. 3

INVENTOR.

JOSEF WAGNER

BY
Moore, Hall & Pollock
ATTORNEYS

Jan. 4, 1966

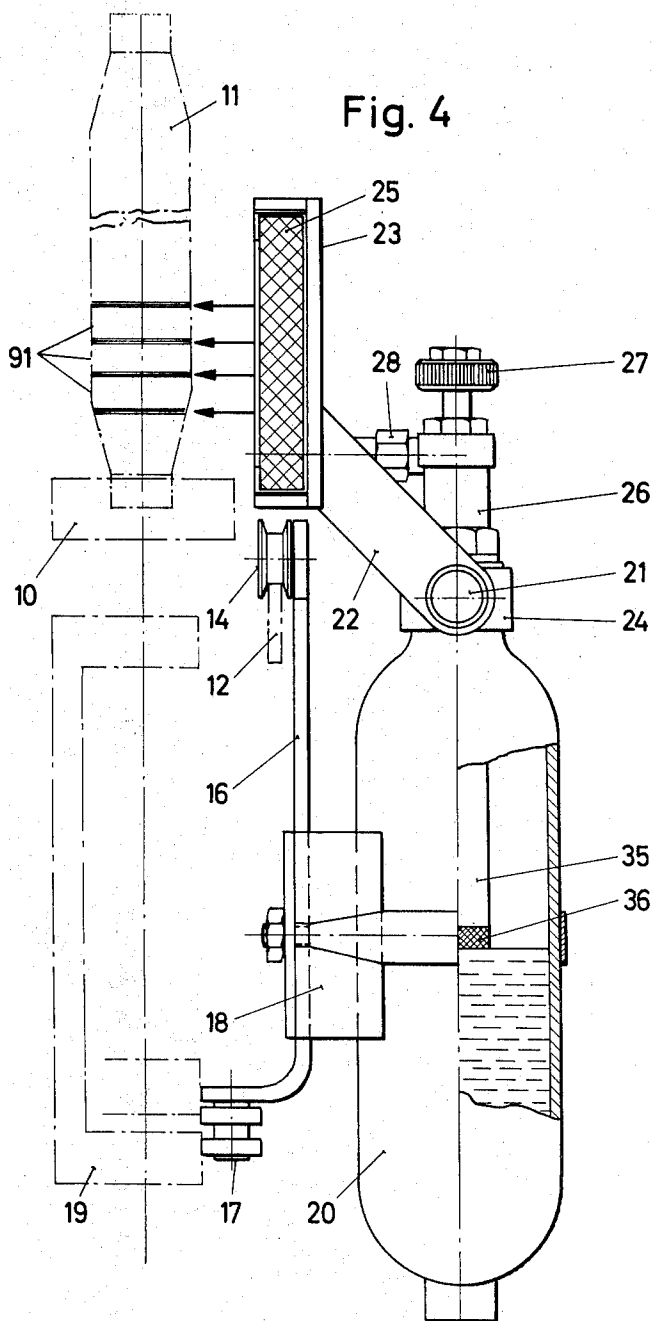
J. WAGNER

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4 Sheets-Sheet 3



INVENTOR.

JOSEF WAGNER

BY
Moore, Hall & Pollock
ATTORNEYS

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J. WAGNER

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4 Sheets-Sheet 4

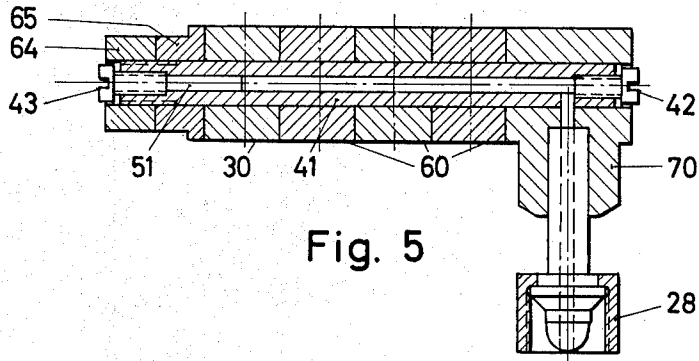


Fig. 5

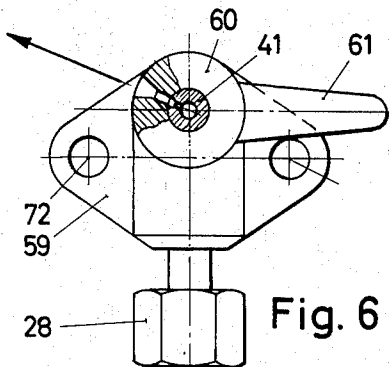


Fig. 6

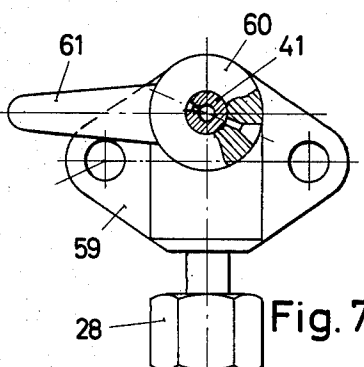


Fig. 7

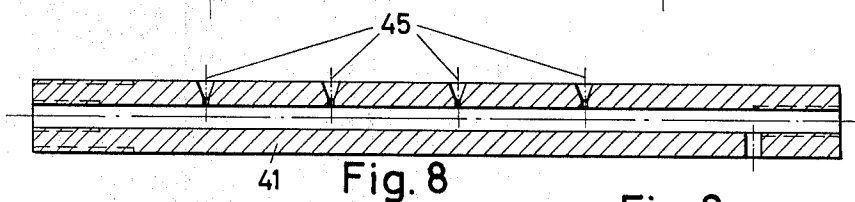


Fig. 8

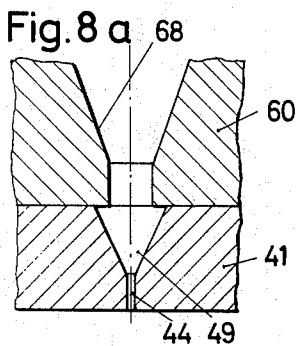


Fig. 8 a

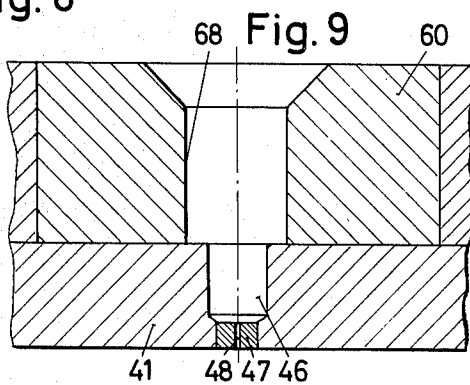


Fig. 9

INVENTOR.

JOSEF WAGNER

BY

Moore, Hall & Pollock
ATTORNEYS

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3,227,134

APPARATUS FOR THE DISTINGUISHING OR MARKING OF SPINNING COPS

Josef Wagner, Froschweilerstrasse 22,
Friedberg, near Augsburg, Germany

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10 Claims. (Cl. 118—315)

This invention concerns an apparatus for the distinguishing or marking of spinning cops on the spinning frame.

In order to distinguish the yarn spun on the spinning frame for further production processes, either the shells on which the yarn is spun, or the body of the yarn itself is marked with a colouring medium.

Since, in the first case, for each kind of yarn, correspondingly marked shells have to be readily available, a very large stock of shells having the various markings is necessary. If the marked shells have passed through working processes before re-use they have to be checked with regard to their dye markings and if necessary sorted, since the shells frequently become mixed due to human error.

Furthermore, the marking of the shells is very time consuming and the shells have to be remarked from time to time due to the large wear and tear.

These disadvantages are of great significance in places where a large number of different quantities of yarn are spun.

It is easier to mark the body of the yarn or the cop itself, and for this purpose it is known for marking chalk to be moved along a stationary row of spun cops thereby producing a coloured dot on the body of the yarn.

As the chalk has to jump from one cop to the next, the speed at which it may be moved along the rows of cops is very limited, and moreover the chalk often tends to break. This tendency for breakage can be lessened by using chalk holders, but it cannot, however, be entirely overcome.

A further disadvantage of this kind of marking is that the quality of the yarn can only be recognised when the marked coloured dot is in view, thus recognition is dependent upon the position of the cop.

Apparatus for marking the cops with a liquid dye are known, which to avoid soiling the spinning machine and the operator, works by wicks which dip into the liquid dye and which likewise produce only a marked dot on each cop. Such an apparatus is also prone to some of the disadvantages aforesaid.

The object of the present invention is to overcome at least to some extent these disadvantages by providing an apparatus for the marking the spinning cops on the spinning frame which operates efficiently and speedily without soiling of the machine or operator and which produces a marking which allows the quality of the yarn to be recognised independently of the position of the cops.

As a device for the distinguishing of spinning cops, according to the invention, an assembly which can be moved along the spindle rail is used, the assembly including means which, when the apparatus is moved past the spinning cops, produce one or more markings on the latter. In accordance with the invention, a track rail is provided, on the spindle run or on the frame of the machine, along which the marking device can be moved.

A further feature of the marking device according to the invention is that it is easy to place on and remove from the track rails.

According to the invention the movement of the marking device can be effected manually or by its own means

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of propulsion such as, for example, a driving motor, especially an electric motor.

According to the invention the marking means comprises means for producing at least one very fine jet of liquid dye which is directed onto the cops to leave an annular dye marking thereon.

According to the invention several jets can be provided for the liquid dye and means are provided for opening or closing the jets individually or in groups or all together.

According to the invention the jets can be fed separately, or in groups, or altogether with the liquid dye. One or more bottles are preferably employed as containers for the liquid dye in which the liquid dye or dyes are stored under air or gas pressure.

In order to be able to effect quick connection of the bottles with the apparatus, quick locking gear is preferably used.

A further feature of the invention is that the jet of liquid comes out of the jets in such a direction that it cannot get into the interior of the machine but only onto the spinning cops.

According to the invention the jet of dye is, therefore, directed at the row of spinning cops at an acute angle from the direction of movement of the marking device.

The invention provides means which catch the drops of dye thrown off from the spinning cops. These means consist of an absorbent pad, for example of felt, which is mounted a short distance away from the row of spinning cops.

According to the invention the felt pad is so mounted as to be easily changed.

According to a further feature of the invention the device is so constructed that both an adjustment of its distance from the row of spinning cops and also its height, and if necessary its lateral position may be effected. The jets are arranged so that they may be rotatably or vertically adjusted either individually or all together.

To avoid the jets becoming blocked, according to the invention a fine or very fine filter is provided, in the liquid dye feed for the jets. A very simple apparatus results if, according to the invention the jets are built as radial bores of a feed pipe. The jets may also be formed by parts set into special radial bores in a feed pipe.

According to a further feature of the invention the jets can be closed by rotatable sleeves which can be arranged for a single jet, or for groups of jets or for all the jets together.

According to the invention the feed pipe is rotatably adjustable so as to adjust the angle of the stream from the jets to the row of cops. Should such an adjustability not be necessary, then the feed pipe can, according to the invention, be pressed or cast into a connecting angle piece. For easier cleaning of the feed pipe, the liquid dye is preferably fed thereto through an angle piece, and in addition the pipe is provided at each end with releasable locking means.

According to a further feature, the apparatus runs, according to the invention, on upper running rollers and lower supporting rollers along track rails on the spinning frame.

The movement along the track rails can be controlled by limit stops which can preferably be so constructed as to actuate the rotary sleeve or sleeves when the movement commences, to open the jets, and again at the end of the movement, to close the same.

The invention will be further apparent from the following description with reference to the several figures

of the accompanying drawings which show by way of example only one device embodying the invention.

Of the drawings:

FIG. 1 shows a perspective view of the marking device with portions broken away;

FIG. 2 shows a front elevation of the marking device of FIG. 1;

FIG. 3 shows a top plan view of the marking devices of FIG. 1;

FIG. 4 shows a side elevation of the device of FIG. 1 with portions in section;

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 3;

FIG. 6 shows the arrangement of the jets with the rotary sleeves of the jets opened;

FIG. 7 shows the arrangement of the jets with the rotary sleeves of the jets closed;

FIG. 8 shows the common feeding pipe having the jets;

FIG. 8a shows an embodiment of the jets;

FIG. 9 shows an alternative embodiment of the jets.

As can be seen from FIG. 1 a plurality of cops 11 are disposed on a row of spindles extending from the rail 10 of the spinning frame. The spindles are adapted to be rotated in a known manner.

Guide rollers 14 are connected by a bar 15 and run on a track rail 12 which is secured to the spindle rail 10. The track rail 12 can if desired also serve as the track rail for the normal take off boxes used on spinning frames.

Two or more angled members 16 (see FIG. 4) are mounted on the bar 15 and extend vertically downwards therefrom and carry on their lower ends rotatably mounted rollers 17 which are adapted to run on a further horizontal rail 19 of the spinning frame.

A suitable container for liquid shown for example as bottle 20, which may be of steel is secured by a holder 18 onto one of the angled members 16. The holder 18 is adapted to allow adjustment of its height.

In case it should be necessary, provision for lateral adjustment of the bottle 20 can be provided; consequently when there are more than two angled members 16 the holder 18 can be inserted between any such two angled members as is desired.

The bottle 20 carries the actual marking apparatus. According to the embodiment, an arrangement of jets 30 (see also FIG. 5), which will be described in greater detail hereinafter, is attached by a quick-locking device 28 to a valve 26 on the bottle 20, the valve 26 having a control 27. A rod 21 is attached to the bottle 20 (see FIGS. 1 and 4) by means of an annular sleeve 24.

The rod 21 which, if necessary, can serve as a handle, carries a frame 23 on two outriggers 22. A very absorbent pad 25 is secured to the frame 23, and this pad serves as a catching device and may for example consist of felt or any other absorbent material. An absorbent pad, which is easily exchangeable, placed on a non-absorbent plate can also be used, or the absorbent pad 25 could be drawable from a roll. The pad 25 is preferably disposed only a short distance away from the row of cops 11. The catching device receives the liquid thrown off from the rotating cops. Preferably the pad 25 is mounted on the marking apparatus itself, and is arranged so that its height and if necessary its lateral position may be adjusted, and is arranged in particular so that its distance from the row of cops 11 can be varied.

The pad 25 may be so mounted in the frame 23 that it can easily be exchanged.

As the whole marking apparatus is in connection with the spinning frame only by means of the rollers 14 and 17 it can be easily and quickly placed in position or removed therefrom. In spite of this, a secure movement along the rails 10 and 12 is ensured. The marking apparatus as a whole can also be so constructed that its distance from the row of cops 11 can be increased or decreased, for

example the provision for adjustment may be incorporated in the holder 18.

The marking apparatus can be passed along the row of cops 11, and this passage can be effected manually or by means of a suitable drive, such as, for example, an electric motor, which may be fed either from means such as an accumulator provided on the marking apparatus or from current supply rails arranged above the rail 12, or elsewhere, such supply rails being connected to a suitable source of supply.

Preferably, the liquid marking dye is water soluble, so that it may readily be removed from the yarn, for example by a washing or bleaching operation.

The liquid dye is stored in the bottle 20 under a suitable air or gas pressure. As an example, a pressure in the range of 3 to 6 atmospheres above atmospheric pressure, may be used. The bottle 20 can be fitted with a filter and a drain cap and also with an air exhaustion valve.

In order to prevent blockage of the jets 30, a supply pipe 35 is provided and has at its lower end, which dips into the liquid dye, a fine filter 36 made of porcelain or of similar material (see FIG. 4).

The liquid dye may be fed under pressure to the arrangement of jets 30 (see especially FIGS. 1 and 5).

The arrangement of jets 30 may contain one or (as shown in the drawings) a plurality of individual jets arranged above one another so that on passage of the marking apparatus, alongside the row of cops 11 which would then be rotating, each cop would be provided with one or (as in this case) a plurality of rings of dye.

If a plurality of jets are presently in the arrangement the jets may be fed individually or by means of a group feed with the dye.

FIG. 5 shows a common feed pipe 41 for all the jets. The liquid dye passes from the bottle 20, through the locking device 28 into the feed pipe 41, the locking device 28 being preferably set at an angle to the feed pipe 41, thereby enabling the latter to be cleaned easily, after loosening and removing the two screws 42 and 43. A straight line feed may of course be used if necessary.

Referring now to FIG. 8 it will be seen that the individual jets 45 are formed by radial borings in the common feed pipe 41. The jets can be either bored directly into the feed pipe 41 as FIG. 8a shows or as shown in FIG. 9 they may be formed in jet blocks 47 similar to the so-called "wire drawings diamonds" which are mounted in the radial borings 48 of the common feed pipe 41.

Behind the actual jet boring 44 which has a suitable diameter, of, for example 0.1 mm. the opening widens out conically or cylindrically for example, as is shown at 49 in FIG. 8a or at 46 in FIG. 9 this allowing easy introduction of a cleaning needle for the jets.

The feed pipe 41 is preferably rotatably adjustable: so as to make possible the adjustment of the angle at which the sprays of liquid emerge therefrom. Height adjustment for the feed pipe 41 can also be provided.

If each jet be formed in a separate part, each such part is adapted for rotatable and vertical adjustment. To prevent the buildup of an air cushion on the topmost jet which cushion could disturb the flow of the liquid from this jet, an inset bolt 51 is provided, as can be seen from FIG. 5, which bolt extends into the bore of the pipe 41 to a position adjacent the topmost jet 45. The inset bolt 51 may conveniently be formed by an extension on the screw 43.

If no adjustment of the jets is necessary, then the common feed pipe 41 as well as the supports of the quick locking device 28 can be firmly secured together by an angle piece 70, which could advantageously be formed from a plastic material by injection moulding same round the common feed pipe 41 and the lock supports. A closure organ in the form of a rotary sleeve 60 is provided for each jet, enabling each individual jet to be opened.

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or closed as desired. If it is only required to operate all the jets simultaneously a single rotary sleeve for all the jets may of course be used.

The rotary sleeves 60 have, at the places at which the jets 45 are arranged in the common feed pipe 41, apertures 68 which are larger and preferably considerably larger than the actual jet openings 44 or 48.

The apertures 68 can be constructed cylindrically at first and then opening conically to the outside. The considerably larger apertures guarantee that the stream of liquid dye can emerge from the jets unhindered and uninfluenced and in as fine a stream as possible.

The common feed pipe 41 has an outer thread at its top end. The individual sleeves 60 are held together on the common feed pipe 41 by means of a nut 65 and a locking nut 64. In order to guarantee a good seal between the feed pipe 41 and the rotary sleeves 60, the clearance between the feed pipe 41 and the sleeves 60 is selected with an extremely small tolerance, so that there is an interference fit between the sleeves 60 and pipe 41. Twisting of the rotary sleeves 60 over the pipe 41 is thus only possible by using appreciable force. By means of projecting actuating levers 61 mounted on the rotary sleeves 60, the sleeves can be pivoted between limit stops 72, from the position shown in FIG. 6 where-in the jet is open to the position shown in FIG. 7 where-in the jet is closed or vice versa. The limit stops 72 are mounted on a flange 59 which can, for example, be formed integrally with the angle piece 70.

The rotary sleeves 60 may be formed from metal or from a suitable plastic material.

According to whether individual rotary sleeves 60 or a common rotary sleeve is provided for the jets 45, they can be opened or closed by the rotary sleeve or sleeves individually or as a group.

The employment of the apparatus according to the invention for marking cops will now be described in greater detail with particular reference to FIG. 3.

In contrast to the known methods, not only one point is produced on the completed cops but one or more complete rings. This has the particular advantage that regardless of the position of the cop the marking can always be seen. By the use of several rings, a considerably larger number of markings for various types of yarn, can be produced and at the same time fewer colours are necessary than when only a point marking is made. Of course it is also possible to mark whilst the cops are at a standstill.

For the production of a ring, the marking is effected whilst the cops are rotating.

Marking rings in this manner would not be possible with marking chalk, because the chalk, in strong contact with the rotating cops would be quickly used up and would produce dust and would damage both the machine and the yarn. Furthermore the danger of breakages would be considerably increased.

For use the marking apparatus is set with its rollers 14 on the track rail 12 and is positioned suitably as regards the distance of the apparatus away from the cops 11, and if necessary as regards horizontal direction, by the adjustment of for example the holder 18.

The jets 45 are so adjusted that the fine stream of dye liquid 90 emerging from their apertures reaches the cops 11 at a predetermined angle. The optimum adjustment depends on the speed of rotation of the cops 11 and the speed at which the marking apparatus is led passed the cops 11.

To prevent the dye from getting into the machine itself the angle selected is preferably smaller than that shown in FIG. 3 contained between the tangent 80 common to two adjacent cops 11 and the direction of passage of the marking apparatus.

The angle of the jets should also be selected so as not to be too acute, so that the length and hence the cross-section is not too great.

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When the marking apparatus is progressed with its jets open past the row of rotating cops 11, the fine stream or streams of dye 90 impinge on the cops 11 and produce one or more rings 91 (see FIG. 4), having a width of 4 to 5 mm. for example. A portion of the liquid dye is immediately taken up and absorbed by the yarn, and a further portion consisting in the main of heavier drops is thrown off by the rotating cops 11 onto the absorbent pads 25 which absorb same. Heavier drops only build up and are to be found in the area between the row of cops 11 and the spraying apparatus, and are never thrown off in a direction towards the inside of the machine. An insignificant dry mist forms as well, but this is not damp and consequently does no damage even though it is possible that a small portion of such could get into the inside of the machine.

As the angle, at which the liquid dye stream leaves, is smaller than the angle between the direction of passage of the marking apparatus and the tangent 80, no liquid dye can get into the inside of the machine between the cops 11.

In order to obtain a truer limitation of the path of the marking apparatus, adjustable limit stops (not shown) can be placed at both ends of the track rail. It lies within the scope of the invention to construct these limit stops, if necessary, in such a manner that they automatically open the rotary sleeve or sleeves 60 at the start of the passage of the marking apparatus and close it or them at the end of its passage.

What I claim is:

1. Apparatus for marking each of a plurality of spinning cops having their respective axes disposed substantially parallel to one another in a given plane on a spinning frame comprising in combination, an assembly adapted to be moved linearly and parallel to said plane and including at least one jet for directing a narrow beam of liquid dye toward said spinning cops, a reservoir for said dye and means for conducting said dye under pressure from said reservoir to said jet, and a track for said assembly on said spinning frame remaining parallel to said given plane containing the axes of said cops, said assembly being coupled to said track for movement therealong enabling the linear travel of said assembly along said line of spinning cops, whereby a narrow stream of dye issues from said jet and marks a band of colour on each said spinning cop.

2. Apparatus according to claim 1 wherein said means adapted to produce markings on each said cop comprises a number of jets each of which is adapted to project a fine stream of liquid dye from said assembly towards said cops, said jets being spaced from one another in a direction parallel to the axis of said cops, whereby each said cop may be marked with a like number of annular bands of dye on passage of said assembly therepast when said cops are rotating.

3. Apparatus according to claim 2 characterised in that each said jet is so directed that it is adapted to project the stream of liquid dye in such a direction that said stream impinges on the plane containing the spinning cops at an acute angle such that said stream cannot pass between adjacent cops into the inside of the spinning machine.

4. Apparatus according to claim 3 wherein said assembly includes a catching device in the form of an absorbent pad lying in a plane substantially parallel to and adjacent to said plane in which said cops lie, said pad device being adapted to collect excess liquid-dye thrown off from said rotating cops.

5. Apparatus according to claim 2 characterised in that a common feed pipe for said liquid dye is connected between said reservoir and all said jets.

6. Apparatus according to claim 5 wherein cut-off means are provided for selectively closing and opening each said jet individually.

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7. Apparatus according to claim 6 characterised in that each said jet is defined by a radially directed boring in the feed pipe and in that said cut-off means comprises for each jet a sleeve rotatable over said pipe, said sleeve having a radial boring and adapted to be moved from an operative or open position wherein said boring is aligned over said jet to an inoperative or closed position wherein said boring is circumferentially spaced from said jet.

8. Apparatus according to claim 7 further comprising an actuating lever projecting from each said rotary sleeve and a stop against which each said lever is adapted to abut when its sleeve is in the operative or open position.

9. Apparatus according to claim 3 wherein said reservoir comprises at least one bottle member for storing said liquid dye under pressure and adapted to supply said jets.

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10. Apparatus according to claim 3 wherein means are provided which allow rotational adjustment of said jets.

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DANIEL BLUM, *Primary Examiner*.

RICHARD D. NEVIUS, *Examiner*.