FIG. 3.

FIG. 4.

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PRODUCTION OF ARTIFICIAL FILAMENTS


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This invention relates to the production of artificial filaments, fibres, threads and the like, hereinafter referred to as threads, from viscose by a box spinning process.

In a box spinning process, viscose is extruded through a jet into a coagulating bath containing sulphuric acid and sodium sulphate with or without other ingredients to form a thread which is passed over one or more godets, down a reciprocating funnel guide to a rotating spinning box which is enclosed in a nestling and in which the thread is collected. During the production of thread there is a tendency for the sodium sulphate to crystallise out on the thread and on parts of the apparatus with which the thread comes into contact after leaving the coagulating bath. The Dawson Patent No. 2,393,595 describes a method of preventing or minimising the crystallisation of sodium sulphate by enclosing the space through which the extruded thread passes during its passage from the coagulating bath to the spinning box and simultaneously spraying water into the enclosed space. In one method of carrying out the process described in Patent No. 2,393,595 the spinning machine is enclosed and water is introduced into the machine through a series of spraying nozzles to maintain an atmosphere of high humidity in the spinning machine.

The spray method described in Patent No. 2,393,595 is efficient in avoiding the difficulties due to crystallisation of sodium sulphate but there is a tendency, particularly with fine deniers, for the dyeing affinity of the collected thread to vary within the cake.

The object of the present invention is to reduce or minimise this variation in dyeing affinity.

According to the present invention the lid for the spinning box nestling used in the spray method of Patent No. 2,393,595 has a central hole permitting the insertion and recirculation of the spinning funnel and one or more ventilation holes between the central hole and the periphery of the lid so that the atmosphere entering the nestling is substantially diverted round and not into the spinning box, and the central hole of the lid has a self-centring cover with a hole of sufficient diameter to allow the funnel to take a close but sliding fit which will not impede the recirculation of the funnel. The lid may have any convenient number of ventilation holes, for example 3 holes equidistantly spaced.

Experiments I have carried out using a spray as described in the above mentioned Patent No. 2,393,595 and containing a rhodamine dyeestant show that with nestling box lids of normal construction the atmosphere entering the nestling is drawn inside the spinning box and then leaves the box mainly past the bottom of the cake and to a lesser extent through the cake; it is believed that this causes a local dilution of the acid liquor carried over by the thread and it is this dilution which is responsible for the variation in dyeing affinity. In accordance with my invention the central hole in the nestling box is reduced by means of a self-centring cover to about the minimum necessary to permit the funnel to traverse freely and ventilation holes are made in the lid between this central hole and the periphery of the lid so that the atmosphere entering the nestling passes outside the box to maintain the desired ventilation and not into the box. Simple experiments using a spray containing a dyeestant will readily indicate by the absence of dye on the collected cake a suitable location for these holes.

One example of the present invention is illustrated in the accompanying drawings in which

Figure 1 is a plan view of a lid for a spinning box nestling according to the present invention.
Figure 2 is a section taken along line II—II of Figure 1,
Figure 3 is a sectional view of a spinning machine according to the present invention showing the ventilation currents, and
Figure 4 is a sectional view showing the ventilation currents obtained with a normal spinning box nestling.

Referring to Figures 1 and 2, a lid 5 for a spinning box nestling has a handle 6, a rim 7, a retaining catch 8, a central hole 9 and three ventilation holes 10, 11 and 12. A self-centring cover 13 for the hole 9 is loosely mounted on the lid 5 by means of a stud 15 on the lid 5 and a slot 14 in the cover 13. The cover 13 has a hole 16 of sufficient diameter to allow the passage of a funnel with a close but sliding fit. The edge of the cover 13 round the hole 16 is turned up to provide a rim 17.

Referring to Figure 3, viscose is supplied from a main supply line (not shown) through a filter 18 to a nozzle 19 in a coagulating bath 20 contained in a tank 21. A freshly formed thread 22 is drawn from the bath 23 by a godet 24, passed to another godet 25 and is laid by means of a reciprocating funnel 26 in a spinning box 27 housed in a nestling 28 having a lid 5 as shown in Figures 1 and 2. The front of the machine is closed during normal working by a window 30 which is hinged at 31 and a nozzle 32 sprays water or steam into the machine. Moisture-laden air which is drawn through the spinning box nestling 28 by a pump (not shown) in the exhaust duct passes down the ventilating holes 10, 11 and 12 and around the spinning box 27 between the box and baffle 35 substantially as indicated by the arrows without entering the box.

In Figure 4 which shows a spinning box nestling with a lid 36 of normal type, moisture-laden air drawn through the spinning box nestling passes down the uncovered central hole 9 into the spinning box 27 and out through the drainage holes 33 substantially as indicated by the arrows giving rise to inequalities of dyeing affinity in different parts of the cake 34.

The lid according to the present invention may be of any suitable dimensions and in one specific example a lid for a spinning box nestling with a normal box 65% inches diameter has an overall diameter of 9½ inches with a central hole of 1¾ inches diameter. Three ¾ inch diameter ventilation holes are equidistantly spaced around the circumference of a 5 inch diameter circle with its centre at the centre of the lid and the central hole has a cover of polyvinyl chloride with a 17/64 inch diameter hole for the passage of a ½ inch diameter funnel.

What I claim is:

1. In a box spinning machine for the manufacture of artificial threads by extruding viscose through a nozzle into a aqueous coagulating bath containing at least one metallic salt, the combination of a closed container including a thread-forming section, a spinning bath within said thread-forming section, a spinning nozzle in the said bath, a spinning box for collecting the thread, a thread-guiding device for leading thread from the thread-forming section to the said spinning box and a funnel for laying the thread in the spinning box, means for spraying finely divided water into the thread-forming sec-
tion to create a moist atmosphere therein to reduce the tendency for the metallic salt of the spinning bath to crystallize on the thread as said thread is guided through the thread-forming section, a nesting for the spinning box, a lid for the nesting having a central hole permitting the insertion and reciprocation of the said funnel, a self-centering cover over the central hole of the lid, the cover having a central hole which makes a close but sliding fit for the funnel, and the lid of the nesting having at least one unrestricted ventilation hole between the central hole of the lid and the periphery of the lid, allowing a substantially unimpeded through-flow of atmosphere, and so located that the atmosphere entering the nesting is substantially directed round and not into the spinning box.

2. In a box spinning machine for the manufacture of artificial threads by extruding viscoso through a nozzle into an aqueous coagulating bath containing at least one metal salt, which machine comprises a closed container including a thread-forming section, a spinning bath within said thread-forming section, a spinning nozzle in said bath, a spinning box for collecting the thread, a nesting for the spinning box, a thread-guiding device for leading the thread from the thread-forming section to the spinning box and a funnel for laying the thread in the spinning box, the combination of means for spraydiving finely divided water into the thread-forming section to create a moist atmosphere therein to reduce the tendency for the metallic salt of the spinning bath to crystallize on the thread as the thread is guided through the thread-forming section, a lid for the nesting of the spinning box having a central hole permitting the insertion and reciprocation of the funnel, a self-centering cover over said central hole, said cover having a central hole which makes a close but sliding fit for the funnel, and said lid having at least one restricted ventilation hole between said central hole and the periphery of said lid allowing a substantially unimpeded through-flow of atmosphere and so located that the atmosphere entering the nestng is substantially directed round and not into the spinning box.

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