

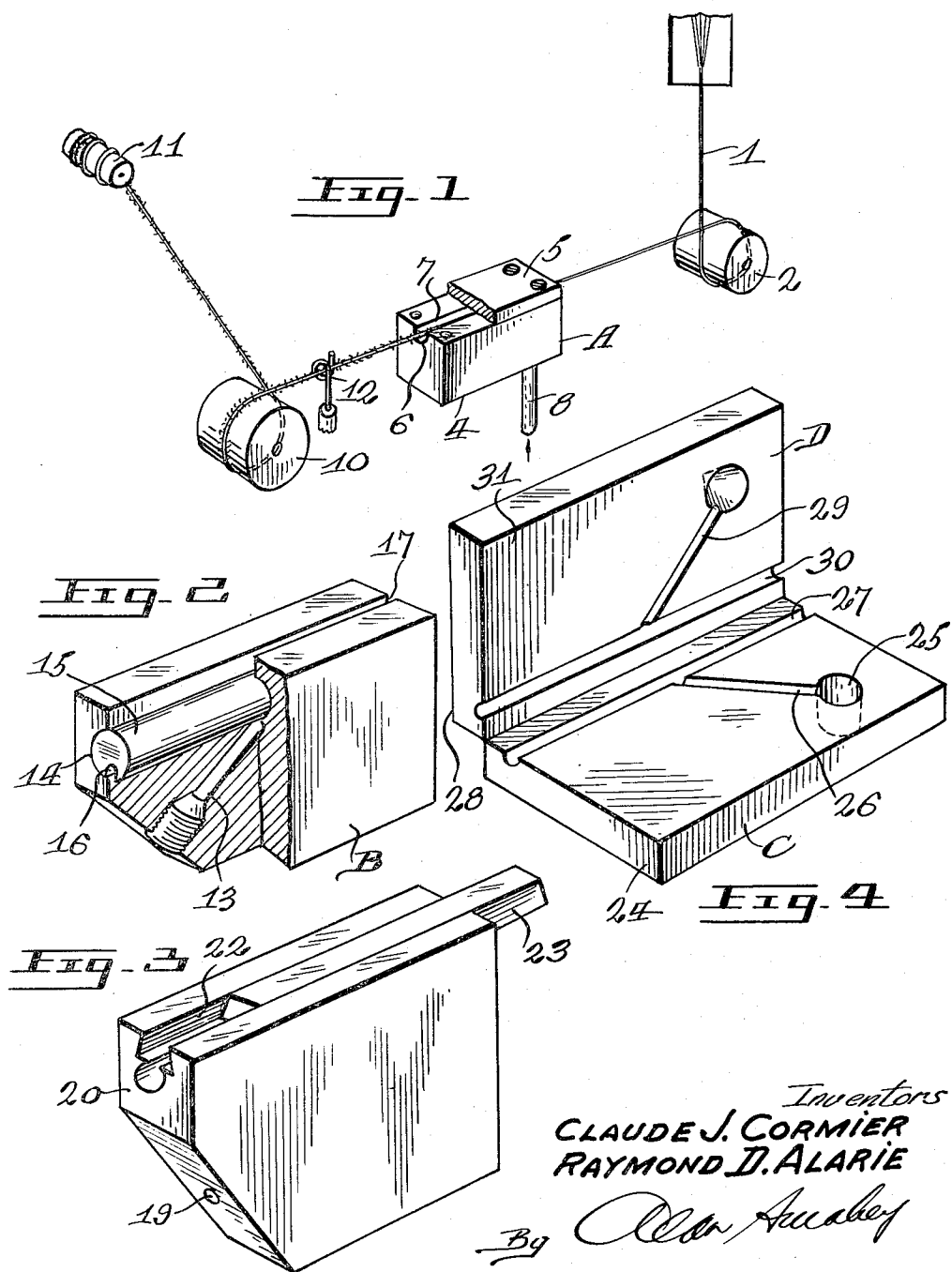
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JET FOR FLUID TREATMENT OF YARN

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1

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JET FOR FLUID TREATMENT OF YARN

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1 Claim. (Cl. 28-1)

This invention relates to apparatus for the production of bulky yarns.

Continuous filament yarns are often passed through air jets to produce loops or convolutions along the individual filaments thereby increasing substantially the yarn bulk and covering power. The conventional nozzles used for this treatment are easily threaded up in some cases, for example when the yarn is on a stationary package or is moving at relatively slow speed. The threading-up operation can then be carried out easily with the help of the suction produced at the yarn inlet by the air jet or even by conventional hooks and thread-up wires. However, where a yarn is moving fast, say several hundred feet per minute and where it cannot readily be slowed down or stopped, the conventional nozzle is generally very difficult to thread. This is particularly true where a continuous operation is desirable. Here extrusion cannot easily be slowed down or stopped so the nozzle has to be threaded with the yarn coming fast from the extruding jets or spinnerettes.

Applicants development

The applicants have now developed an apparatus which overcomes these problems. In a general sense, this apparatus is a fluid nozzle which comprises a body having a yarn passage which is provided with an access opening along its entire length in the axial direction and an air passage leading to the yarn passage from an air connection. A removable cover member is adapted to be brought into registering position with the body to close the opening in the yarn passage for yarn treatment and to be removed to non-registering position for yarn threading.

In one form of such device, the body is a block having an elongated flat surface and the yarn passage or channel runs along parallel to the flat surface with its access opening in the axial direction opening on to the surface. Preferably, the yarn channel is more or less circular in cross-section, the feeding opening being on a chord of the cross-section. The air passage extends through the block, from an air connection, to a junction with the yarn passage. A cover plate is placed on the flat surface to close the side opening in the yarn passage for the purpose of treating yarn, and is removed for the purpose of feeding yarn into the passage.

An alternative form of device also employs a block similar to that just described, but in this case it has an axial passage provided with a plug having an axially extending yarn channel which can be brought into register with the opening in the block above the yarn passage or rotated so that the yarn channel in the plug and the passage in the block do not register but the yarn channel in the plug registers with the end of the air passage.

In another preferred form of the invention, the yarn passage access opening, instead of extending to the surface of the block, extends to a groove inset in the surface of the block, preferably a dovetailed groove, and a dovetailed tongue is provided to slide into the groove to close the lateral opening in the yarn passage.

In still another form of device, the block is made in two registering sections, part of the yarn passage being on each section so that when the sections are juxtaposed, an enclosed yarn passage is provided. The air passage

2

is also partly on each section, with the exception that it does not extend to the edges of the sections of the block, but terminates short of the edges and extends laterally through the side of one block to an air connection.

The invention has been described in general and it will now be referred to more specifically by reference to the accompanying drawings which show preferred embodiments and in which

FIGURE 1 is a schematic perspective view of a yarn bulking machine embodying a preferred form of air nozzle according to the invention.

FIGURE 2 is a perspective view of one form of air nozzle of this invention with the body cut away to show the internal structure.

FIGURE 3 is a perspective view illustrating another form of air nozzle according to the invention.

FIGURE 4 is a perspective view of still another form of air nozzle according to the invention.

Referring to FIGURE 1, yarn 1 is delivered by a feed roll 2 to an air nozzle A. The nozzle is made up of a main member or elongated body 4 provided with a tubular yarn passage 6 opening onto the surface of nozzle A as at 7. A cover plate 5 is removably held in position by screws and when in place serves to close the passage 6. A conduit 8 supplies compressed air to the nozzle. The treated yarn passes through a guide 12 then around a roll 10 and finally is wound on the take-up package 11. The package 11 is driven by a constant linear speed type winder which is not shown.

A preferred way of threading up the nozzle is as follows. The yarn coming from feed roll 2 is pulled away by appropriate means, for example, an air ejector (not shown). The nozzle is then brought in position with its cover plate 5 removed so that the yarn can be slipped in the passage 6 through the slot 7, then the cover plate 5 is replaced. Compressed air is then admitted to the nozzle to act on the yarn. The treated yarn is wrapped around roll 10 and tied to the winding package 11.

FIGURE 2 shown an alternate form of nozzle according to the invention. It includes a body B having a tubular passage 13 for supplying compressed air and a larger cylindrical bore 14 that runs along the entire length of the body. A cylindrical member 15 fits within the bore 14 tightly enough to prevent air from escaping between it and the cylindrical member 15 but still allows the cylindrical member 15 to rotate. The member 15 has a longitudinal slot 16 which forms the yarn passage when it faces the air inlet 13. The slot 16 may also be positioned in line with slot 17 of the main body, by rotating the member 15 through 180°. This makes for the yarn to be slipped in.

Another form of nozzle shown in FIGURE 3 has a tubular bore 19 for feeding compressed air, a cylindrical passage 20 for passing the yarn and a dovetail groove 22 parallel to the yarn passage 20 and joining it. The groove 22 is normally occupied by a sliding tongue 23.

The nozzle of FIGURE 4 has a panel C having a compressed air source passage 25 and a groove 26 which starts at the groove 27. The groove 26 runs obliquely with respect to the axis of the panel C and meets groove 27 which runs to the long axis of the panel C. A panel D has registering grooves 29, 30 on one of its surfaces so that when the panels C and D are brought into registering contact the matching grooves form both the tubular yarn passage and the tubular air passage.

The operation of the other forms of device will be evident from their structure in conjunction with the description of the operation of the initial form above.

The parts of the device may be made from any convenient material, for example, wood, plastic material or

metal or combinations of the various different materials.
We claim:

A fluid nozzle for treating yarns, comprising, an elongated body provided with a dove-tail shaped groove extending from the surface thereof and a narrower elongated yarn passage forming an extension of said groove, a dove-tailed tongue slidable in said groove to close the yarn passage off from said groove for yarn treatment and to expose it for yarn feeding, said body being provided

with an air passage leading from an air connection to said yarn passage.

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