June 22, 1954

E. J. GRISET, JR

REMOVABLE AIR JET

Filed March 3, 1952

2,681,729

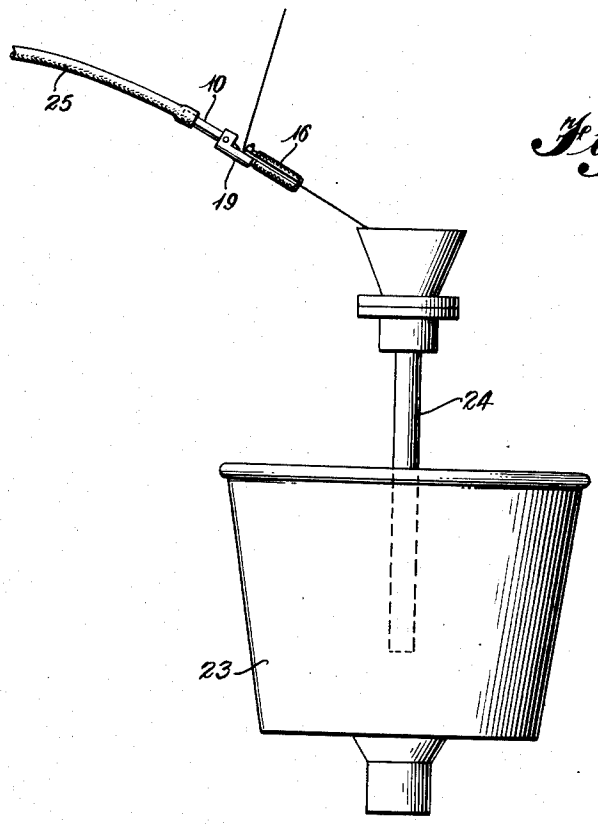


Fig. 1.

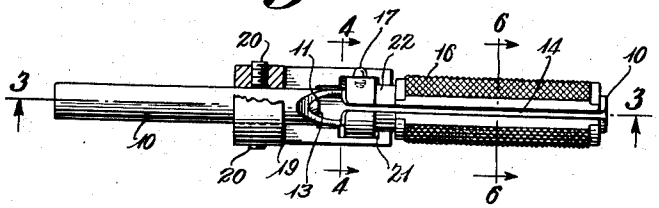


Fig. 2.

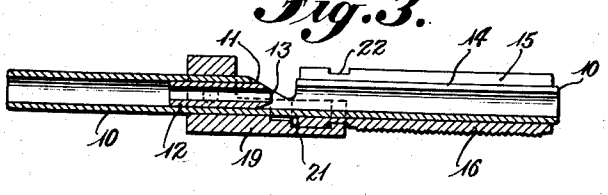


Fig. 3.

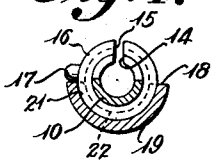


Fig. 4.

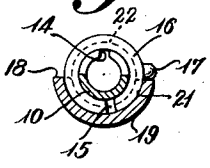


Fig. 5.

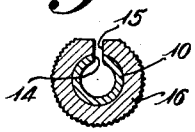


Fig. 6.

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REMOVABLE AIR JET

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12 Claims. (Cl. 203—67)

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This invention relates to the collection of thread and more particularly to improved methods and apparatus for the temporary collection of thread and the directing of that thread toward or into propelling or collecting equipment.

In application Serial No. 237,526 there is shown and described a suction device which comprises a notched tubular housing. Air under pressure is emitted from a nozzle at the bottom of the notch and in axially spaced relation to the nozzle, there is an eduction tube so that a low pressure zone or venturi is provided at the base of the notch and thread introduced at that point is sucked into the eduction tube and delivered to a waste box or the like. The same type of low pressure zone is contemplated by the present invention. Since the suction on the thread is constant and is at a value below the breaking point of the thread, the operator can manipulate the thread running to the device while loss of control is avoided by the steady suction.

Although the foregoing device is of very wide utility, it is not susceptible of use in cases where the thread actually passed through the device is to be used, the ordinary situation being the threading of a permanent take-up device with a loop drawn between the thread source and the suction device and the subsequent severing of the thread at a point between the permanent take-up device and the suction device.

It is an object of this invention to improve the invention described above and to provide for the temporary collection of thread by suction, the discharge of that thread into a selected zone of collection and the subsequent disassociation of the running thread from the influence of suction without severing.

It is a further object of this invention to provide a suction device which can be removed from a running thread and which is capable of directing a thread passing therethrough to a draw-off device or other selected target.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description thereof in conjunction with the annexed drawings wherein:

Figure 1 is a fragmentary view in elevation of the apparatus of the present invention as employed in threading-in the funnel of a spinning pot;

Figure 2 is a view in top plan of an improved suction device according to the present invention;

Figure 3 is a view in side elevation of the suction device of Figure 2;

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Figure 4 is a view in section taken on the line 4—4 of Figure 2;

Figure 5 is also a view taken on the line 4—4 of Figure 2 but showing the parts in a different position of adjustment from that shown in Figure 4; and

Figure 6 is a view in section taken on the line 6—6 of Figure 2.

Referring to the drawings, it will be observed that the suction device comprises a generally cylindrical pipe 10 having a notch therein at 11. Air, or other gas, under pressure is delivered to the base of the notch through a tube 12, which is housed in the left end of the pipe 10 as it is viewed in Figure 2. The tube 12 terminates near the bottom of the notch in a frusto-conical nozzle 13. The high velocity stream of air leaving nozzle 13 creates a low pressure zone in the notch, so that thread placed adjacent the notch is drawn into the air stream by suction and propelled through pipe 10. Axially spaced from the nozzle the pipe 10 is provided with a radial slot 14 which extends for the axial length of the pipe 10 between the base of the notch 11 and the right-hand end of the pipe as it is viewed in Figure 2.

Surrounding the slotted portion of the pipe 10 there is a sleeve 16 which is circumferentially interrupted at 15 to an extent equal to the width of the slot 14. The sleeve is mounted to rotate about the pipe and, to this end, it is provided with a guiding pin 17 which acts against radial surfaces 18 of a sleeve-like member 19 which surrounds the pipe 10 to the left of the notch 11 as it is shown in Figures 2 and 3. The member 19 is affixed to the pipe 10 by set screws 20 and it is provided with an arcuate groove at 21 which receives the left end of the sleeve 16 which is circumferentially reduced at 22 so that it can be held against axial movement by the member 19 in both of its positions of use, see Figures 4 and 5. Member 19 may constitute a support for the entire suction device assembly.

Upon references to Figures 4 and 5, it can be seen that by rotating the sleeve 16 in a counterclockwise direction from the Figure 5 position, the slot at 15 in the sleeve 16 can be registered with the slot at 14 so that a thread running through the pipe 10 can be passed out of the suction device radially through the slots 14 and 15. When the slot 15 of the sleeve 16 is out of registry with the slot 14 of the pipe 10, the thread will be carried through the pipe and discharged from the right-hand end thereof as viewed in Figure 1.

In application Serial No. 237,526, there is shown

a device generally similar to the one here shown except for the construction of the pipe which is at all times circumferentially continuous, with the result that any thread propelled through the suction device could not be disengaged from the device without breakage. On the other hand, with the provision of the sleeve 16, it is possible to close the slot 14 to permit the device to act in a normal way as its predecessor did and yet by turning the sleeve to register the slots 14 and 15 thread passing through the device may be withdrawn without breakage.

An example of a typical use of the present invention is to be found in Figure 1. In Figure 1, the numeral 23 represents a spinning pot and the numeral 24 represents the funnel associated therewith. In pot spinning, the pot is caused to rotate and thread is introduced into the funnel which is reciprocated relative to the pot to lay up therein succeeding superimposed courses of thread to form a cake or cheese. It has heretofore been the practice to introduce the thread into the funnel by water cascade which requires a spigot aligned with each funnel of the pot-spinning machine. By the use of the present invention, the spigots can be avoided and the temporary collecting device can be moved along portable-fashion from station to station as the pots are threaded in.

To this end compressed air is provided through a flexible tubing 25 attached to the pipe 10. Thread issuing from a spinning source, not shown, is thrown into the notch at 11 entrained by the compressed air and ejected through end of the pipe 10. The ejected thread follows the direction of its propelling air path for quite some distance beyond the right-hand outlet of the pipe 10 as it is viewed in Figure 1. The operator, therefore, can direct the pipe 10 to cause the thread to enter the mouth of the funnel 24. When it has entered the mouth of the funnel, and is running freely therein, the operator needs only to turn the sleeve 16 to the Figure 2 and Figure 4 positions to permit withdrawal of the thread running between the spinning source and the funnel through the slots 14 and 15. Thereafter the operator may move to the next station and repeat the steps described above.

Conversely, after a cake has been formed, the thread can be directed to a temporary point of collection during the cake doffing operation, simply by aligning the slots 14 and 15 and causing them to enter the path of travel of the thread. The sleeve 16 is then turned so that the slots are no longer in registry and the air supply is turned on, the thread severed between the suction device and the funnel and redirected to a temporary point of collection.

It will be understood in the threading-in method described above that the operator may cut off the flow of compressed air before turning the sleeve 16 to the Figure 4 position to release the thread. It is likewise to be understood that the illustration of the suction device in connection with a pot spinning machine is illustrative rather than limiting, in that, the device is useful in connection with many types of thread drawing devices such as where a thread is drawn between two rollers or is otherwise mechanically collected from a point to which the thread cannot be conveniently or easily led by hand.

Additionally, the invention is not limited to the use of air for effecting a pressure differential at the point of thread entry since other gases obviously can be employed if desired. As a matter of fact, other fluids such as treating liquids, e. g., water may be preferred for certain processing treatments.

What is claimed is:

1. Suction-type thread-drawing apparatus comprising a pipe having a notch therein, a jet to supply a fluid under pressure through one end of said pipe, said pipe having in its other end an axially continuous slot, which is adjacent the jet and a sleeve mounted for circumferential movement about said other end of said pipe and having a slot therein movable to and from registry with the slot in the pipe.

2. Suction-type apparatus for drawing thread that comprises a pipe having a notch therein and a fluid inlet portion and a fluid exhaust portion separated by the notch, a jet projecting from the fluid inlet portion of said pipe into said notch, means to supply fluid under pressure to said jet, an axially continuous radial slot in said fluid outlet portion of said pipe, said slot being adjacent the nozzle and means selectively to close and open said slot.

3. Suction-type apparatus for drawing thread that comprises a pipe having a notch therein and a gas inlet portion and a gas exhaust portion separated by the notch, a jet projecting from the gas inlet portion of said pipe into said notch, means to supply compressed gas to said jet, an axially continuous radial slot in said gas outlet portion of said pipe, said slot being adjacent the nozzle, a sleeve mounted for circumferential movement about the gas outlet portion of said pipe, said sleeve having a slot therein registerable with the slot in the gas outlet portion of the pipe.

4. Suction-type apparatus for drawing thread that comprises a pipe having a notch therein and a gas inlet portion and a gas exhaust portion separated by the notch, a jet projecting from the gas inlet portion of said pipe into said notch, means to supply compressed gas to said jet, an axially continuous radial slot in said gas outlet portion of said pipe, said slot being adjacent the nozzle, a sleeve surrounding the gas outlet portion of said pipe, means mounting said sleeve on the gas outlet portion of said pipe for limited arcuate movement relative thereto, said sleeve having a slot therein registerable with the slot in the gas outlet portion of the pipe.

5. The method of threading-in a thread drawing device that comprises initially drawing a thread into a circumferentially continuous zone of high velocity gas flow, projecting the thread so drawn into said device, discontinuing the high velocity gas flow in said zone and disestablishing the circumferential continuity of said zone.

6. The method of threading-in a thread drawing device which comprises initially drawing a thread into a circumferentially continuous tube having a gas flowing therethrough at high velocity, projecting the thread issuing from the tube into said device, discontinuing the gas flow through the tube and withdrawing the tube from around the thread running to said device.

7. A device for handling a running yarn comprising a body having a passageway extending therethrough, and means for continuously transferring the yarn lengthwise of the passageway and through the device comprising pneumatic means for propelling a yarn-carrying fluid the entire length of the passageway, said body comprising at least two portions, one portion being movable with respect to the other to open the

passageway laterally with respect to its entire length.

8. A device for handling a running yarn comprising a body having a passageway extending therethrough, and means for continuously transferring the yarn lengthwise of the passageway and through the device comprising suction means for propelling a yarn-carrying fluid the entire length of the passageway, said body comprising at least two portions, one portion being movable with respect to the other to open the passegeway radially with respect to its entire length.

9. A device for handling a running yarn comprising a body having a passageway extending therethrough, and means for continuously transferring the yarn lengthwise of the passageway and through the device comprising means for propelling a liquid the entire length of the passageway, said body comprising at least two portions, one portion being movable with respect to the other to open the passageway radially with respect to its entire length.

10. A device for handling a running yarn comprising a body having a passageway extending therethrough adapted for lengthwise passage of the yarn, duct means terminating at the passageway, the other terminus of the duct means being adapted for connection with means for supplying a fluid at superatmospheric pressure, and said body comprising at least two portions, one portion being movable with respect to the other to open the passageway radially with respect to its entire length.

11. A device for handling a running yarn comprising a body having a passageway extending

therethrough, duct means terminating at the passageway, the other terminus of the duct means being adapted for connection with means for supplying a fluid at superatmospheric pressure, said body having an outer portion and an inner portion, each portion having a slot generally parallel to the passage and extending the entire length of each respective portion, at least one of said portions being movable relative to the other to bring the slots into a common radial alignment with respect to the passageway to open it along its entire length.

12. A suction device having a strand-receiving port and a strand-discharging port connected by a passageway, said device comprising at least two longitudinally extending portions, each portion having a slot generally parallel to the passageway, at least one of said portions being movable to bring the slots into superposition with said passageway to radially open the passageway along its entire length, and means for forcing a jet of fluid along a path concentric to the passageway and out of the device through said strand-discharging port.

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