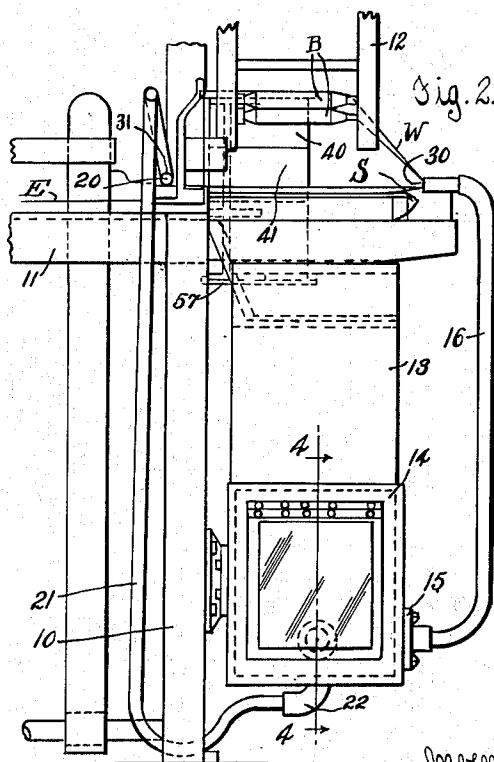
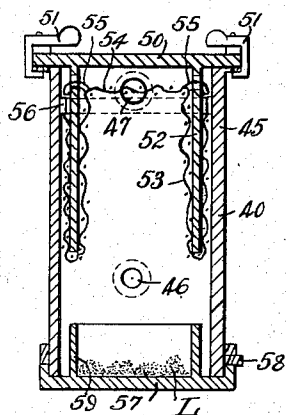
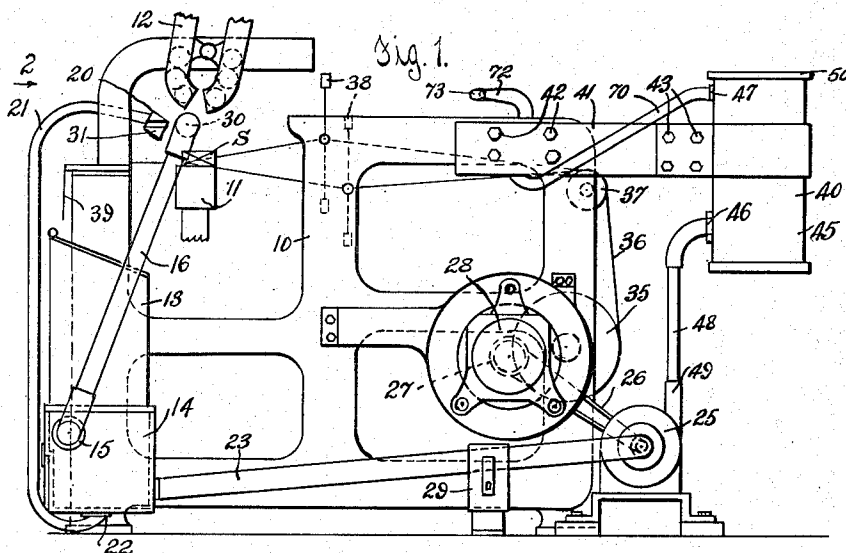


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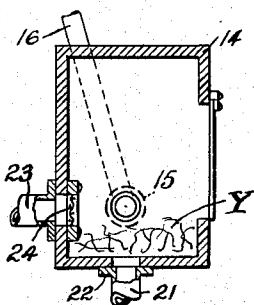


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Sig. 1.

May 21, 1946.

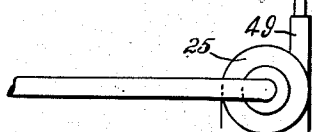
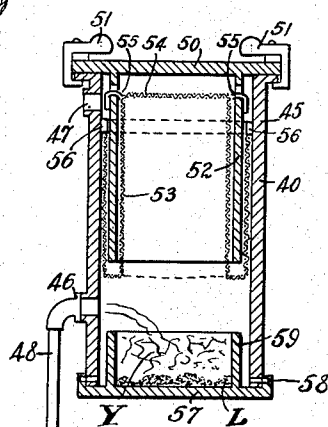
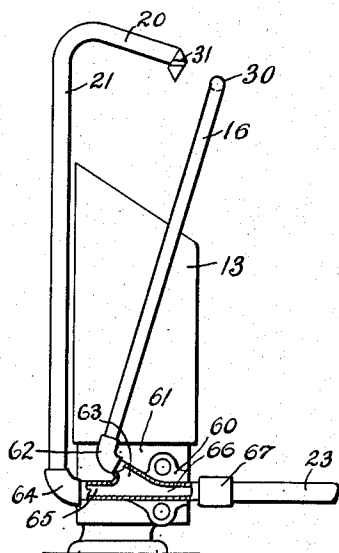
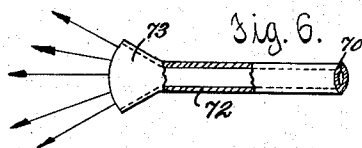
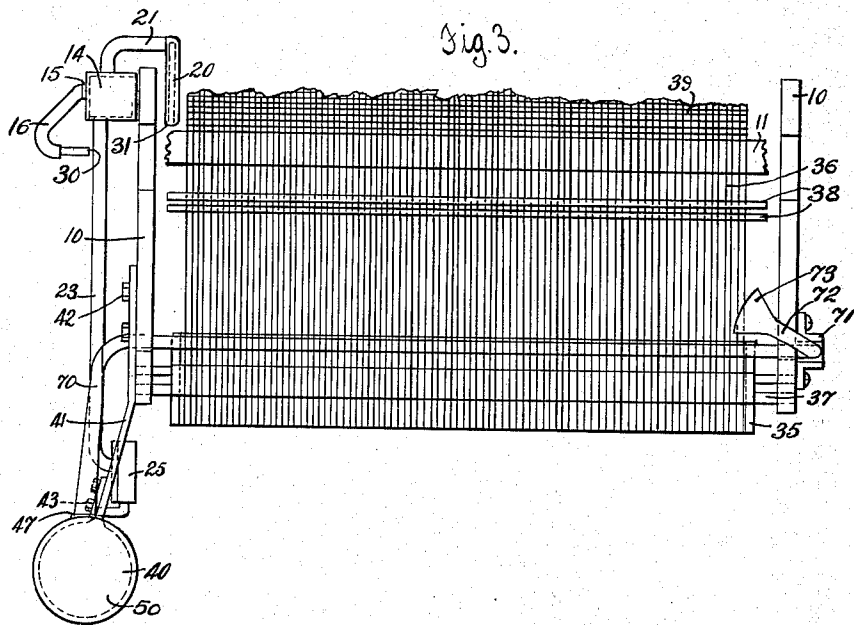
R. G. TURNER

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LOOM

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,400,792

LOOM

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Application June 3, 1944, Serial No. 538,603

2 Claims. (Cl. 139—224)

This invention relates to weaving and it is the general object of the invention to provide a weaving unit including means to remove from the air thereabout lint which arises due to operation of the unit.

In the process of weaving the successive crossings of the warp threads produce a considerable amount of lint which floats in the air around the loom. This lint accumulates on various parts of the loom such as stop motions, and interferes with their correct operation, and is also likely to be drawn into the warp shed and cause blemishes in the cloth. The lint results from operation of the loom and it is an important object of my present invention to equip the loom with an air cleaning system which it operates during the weaving process. The air cleaning or filtering system is thus operated by the loom whenever the latter produces lint.

It is another object of my invention to provide the system with an air intake mouth and exhaust the cleaned air from the filtering system toward the intake mouth so that the lint laden air around the loom will be blown to a point where it can be drawn into the air cleaning system.

Since the crossings of the warp sheds produce much of the lint it is a further object of my invention to blow the cleaned air across the warp toward the aforesaid intake mouth so that the lint floating over the warp will be directed toward the mouth.

Heretofore I have proposed the use of a pneumatic system for removing the waste threads which remain incident to the replenishing operations of bobbin changing looms. Some of these threads are removed by a pneumatic thread holder located beyond the bobbin magazine and others are removed by an extractor between the magazine and cloth. As shown more particularly in my prior Patent No. 2,199,354 the intake mouths of the pneumatic devices for receiving these threads are located adjacent to the bobbin magazine and are connected pneumatically to a pump which operates during loom operation to draw the waste threads out of the path of the shuttle and into a thread trap. It is another object of my present invention to combine the waste thread removing devices with an air filtering system which utilizes the intake mouths for the threads as the intake for the air to be cleaned. In one form of my invention I use the air filter as a trap for the waste threads.

With these and other objects in view which will appear as the description proceeds, my in-

vention resides in the combination and arrangement of parts hereinafter described and set forth.

In the accompanying drawings, wherein two forms of my present invention are set forth,

5 Fig. 1 is a side elevation of a loom having the preferred form of my invention applied thereto,

Fig. 2 is a front elevation of the structure shown in Fig. 1, looking in the direction of arrow 2,

10 Fig. 3 is a plan view of the loom shown in Fig. 1, parts being omitted,

Fig. 4 is a vertical section on line 4—4 of Fig. 2 through the thread trap with the bobbin can removed,

15 Fig. 5 is a vertical section through the air filter shown in the upper right hand part of Fig. 1 when it acts only to remove lint from air passing through it,

Fig. 6 is a detail showing the exhaust pipe for the unit, and

20 Fig. 7 is a view similar to a part of Fig. 1, but showing a modified form of my invention in which the air filter also acts as a thread trap.

Referring particularly to Fig. 1, I have shown 25 a loom frame 10, a lay 11, a reserve bobbin magazine 12 supported by the frame 10 and a bobbin can 13 resting on a thread trap formed as a hollow box-like structure 14. The latter may be formed as shown in Fig. 4 and has secured thereto as at 15 the lower end of a pneumatic thread holder tube or pipe 16, the upper end of which as shown more particularly in Fig. 2 receives the weft ends W from bobbins B in the magazine 12. The pipe 16 communicates 30 with the interior of the thread trap 14 so that threads drawn into the upper end of the thread holder pipe can pass into the trap.

A thread remover 20 is mounted between the magazine and the center of the loom as suggested in Fig. 2 and is connected by a pipe 21 to the under side of the thread trap 14 as at 22. A vacuum pipe 23 extends rearwardly from the thread trap and is provided with a screen 24 which prevents threads from passing from the interior of the trap 14 into the pipe 23. The rear end of pipe 23 is connected to a fan 25 which is driven by a belt 26 trained around a pulley 27 driven by the loom motor 28. The latter is supported in any approved manner on the loom and is controlled from an electric switch box 29 supported near the motor and on the floor on which the loom rests. The purpose of the fan is to create sub-atmospheric pressures within the trap 14 so that streams of air constantly move into the intake mouths 30 and 31 of the thread holder 50

and thread remover, respectively. The latter operates to remove a thread E extending from the shuttle S toward the center of the loom when it is cut at the selvage, the thread thus cut moving through mouth 31 and down through pipe 21 into the trap 14. Similarly, the weft ends W which are cut one by one at the selvage subsequent to transfer of their corresponding bobbins are drawn into their mouth 30 and are then drawn down through pipe 16 to the thread trap.

The loom is provided with the warp beam 35 having a sheet of warp 36 extending upwardly therefrom and around a whip roll 37. The warp threads then extend forwardly through harness frames 38 two of which are shown in Figs. 1 and 3. From the harness frames the warp threads lead forwardly to the cloth 39. During loom operation the harness frames 38 are reciprocated to effect crossing of the warp threads at regularly recurring intervals whenever the loom is in operation.

The matter thus far described may be made either according to standard loom construction or as set forth in the aforesaid patent and in my co-pending application Serial No. 526,033, filed March 11, 1944. When the switch 29 is closed the motor 28 operates by connections not shown but well understood to cause successive crossings of the warp threads by the harness frames, one result of which is to produce a considerable amount of lint which floats in the air about the loom. The fan 25 is also caused to turn whenever the motor is in operation so that air is drawn into the intake mouths 30 and 31 whenever the warp threads are being crossed.

In carrying the preferred form of my present invention into effect I provide means by which the air which is drawn into the intake mouths 30 and 31 may be cleared of the lint in it and then discharged preferably though not necessarily at a point near the loom. Accordingly, I provide an air filter unit 40 which is held in the position shown in Fig. 1 by a bracket 41 secured as at 42 to the loom frame. This bracket may conveniently be a strip of sheet metal wrapped around the unit 40 and clamped in holding position as at 43. The unit 40 includes a vertical cylinder 45 having an intake 46 and an outlet 47. The intake is connected by a pipe or tube 48 to the discharge end 49 of fan 25.

A cover 50 is held in position by clamps 51 which ordinarily hold the cover down tightly against the top of the cylinder to prevent air leakage. The cover has depending therefrom a sleeve 52 around which extends a cloth filter bag 53 the closed end 54 of which is held to the sleeve by straps 55. The open end of the bag is outside sleeve 52 and is secured to inner walls of the cylinder 45 by a ring 56 held in any approved manner on the cylinder. The cylinder 45 has a bottom 57 detachably held thereto as at 58 and has an upwardly facing pan 59 to catch lint, dirt, etc., which falls from the bag. The clamps 51 and connections 58 are shown in Figs. 5 and 7, but have been omitted from Figs. 1, 2 and 3.

In the operation of the unit 40 the air which is drawn into the intake mouths 30 and 31 passes through the thread trap 14 and pipe 23, then through the fan 25 and upwardly through the pipe 48 and into the cylinder 45 through the inlet 46. The air is then forced through the bag 53 into that part of the unit which communicates with the outlet 47. The lint in the air thus accumulates on the bag so that the air which reaches

the outlet is clean. In the operation of the preferred form of the invention which has just been described the waste threads or yarns Y which are removed from the loom incident to replenishing operations are held within the trap 14 by means of the screen 24 and do not enter the pipe 23, the fan or the filter unit 40, and the lint collects at L in pan 59, see Fig. 5.

In the modified form of my invention set forth in Fig. 7 the intake mouths 30 and 31 and their pipes 16 and 21 are connected to a fitting 60 fastened to a bracket 61 secured to the loom frame and on which the bobbin can 13 rests. Pipe 16 connects as at 62 to a passage 63 of the fitting, while pipe 21 connects as at 64 to a passage 65 of the fitting. Both of the passages connect with a third passage 66 connected at 67 to pipe 23. The fitting 60 does not contain a screen so that the threads pass from the intake mouths through the fitting 60 and pipe 23, through the fan, and then upwardly into the unit 40. In this modified form of the invention the unit 40 is the same as that used in the preferred form, but it serves both as an air filter and a thread trap. In Fig. 7 the waste threads Y are shown in the pan 59.

In both forms of the invention I find it convenient to direct the exhaust air from the unit 40 toward the intake mouths 30 and 31. This feature of the invention is shown more particularly in Fig. 3 where it will be seen that the outlet 47 is connected to a pipe 70 which extends from the magazine side of the loom to the opposite side where it is held by a bracket 71, see Fig. 3. The end of the pipe 70 extends horizontally as at 72 and is pointed across the warp toward the intake mouths 30 and 31. The end of the pipe may be flared as at 73, if desired, see Fig. 6, in the shape of a fan to direct the air issuing therefrom in a flat broad stream across the warp threads. The particular form of the end of the pipe shown in Fig. 6, however, is not important but it is desirable that the discharged air set up a draft across the warp threads toward the magazine and the intake mouths for the system.

In operation, whenever switch 29 is closed motor 28 will run to operate the loom and turn the fan 25, whereupon the pneumatic system including the intake mouths, pipe 23, the fan 25 and unit 40 will be set in operation. The crossing of the warp threads incident to loom operation will produce the aforesaid lint and some of the air in which the lint is suspended will be drawn into the two intake mouths and pass through the system and then be discharged from the unit 40 in cleaned condition. During this operation the removed lint L will be collected in the pan 59 of the filter 40.

I do not wish necessarily to be limited to the switch 29 as a means for controlling the loom and it is set forth herein as illustrative of only one means by which the loom can be started and stopped. In the preferred form of the invention the waste threads Y which are left incident to replenishing operations of the loom collect in the thread trap 14, but in the modified form of the invention the threads Y are passed through the fan and collect in the unit 40, falling as indicated in Fig. 7 into the pan 59 along with the lint L. So far as certain features of my invention are concerned it is desirable that the air cleaning system be used in connection with the waste thread removing devices, but the latter are not essential in all applications which can be made of the invention. Whenever the loom stops

for any extended period the air cleaning system also is brought to rest so that there is no waste of power at the fan when lint is not being produced at the loom.

From the foregoing it will be seen that I have provided a weaving unit having a built-in air cleaning system by which the air around the loom, or in its locale or vicinity, can be freed of the lint which floats in it incidental to loom operation. The air cleaning system is preferably connected to the loom and operates only when the latter operates, and causes circulation of part of the air around the loom through the filtering system. Furthermore, it will be seen that the outlet from which the cleaned air issues is directed toward the intake mouths 30 and 31 and preferably though not necessarily across the warp. By this means a steady stream of lint is directed toward the intake mouths. Also, when the invention is applied to weft replenishing looms the intake mouths can be utilized for removing waste threads and the latter may collect either in the trap 14 according to the preferred form of the invention, or may be passed on to the unit 40 in the modified form of the invention. In the latter case the thread cleaning unit serves not only to remove lint from the air which passes through it, but also acts as a thread trap.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a weft replenishing loom having a reserve bobbin magazine and in which waste threads remain adjacent to the magazine incident to replenishing operations, the operation of the loom causing the air around the loom to become laden with lint particles, pneumatically acting waste thread removing means having an intake mouth adjacent to the magazine to receive the waste threads and lint laden air, an air filter operative to remove lint from air passing therethrough, and pneumatic means to draw said waste threads and air into said mouth and pass the air through said filter and then direct the air toward said magazine.
2. In a weft replenishing loom in which waste threads remain adjacent a bobbin magazine incident to replenishing operations, the operation of the loom producing lint particles which float in the air around the magazine and loom, pneumatic thread removing means having an intake mouth permanently located adjacent to said magazine and in position to draw said waste threads therein when air is drawn into said intake mouth by suction, an air filter operative to remove lint from air passing therethrough and having an outlet adjacent to the loom facing the magazine, and pneumatically acting means which draws air into said intake mouth by suction to effect removal of said waste threads and causes the air so drawn to pass through and have the lint removed therefrom by said filter and then discharged from said outlet toward the magazine.

RICHARD G. TURNER.