M. ROSENTHAL.

SUCTION APPARATUS.

APPLICATION FILED MAR. 4, 1914.

1,191,237. Patented July 18, 1916.

Fig. 2.

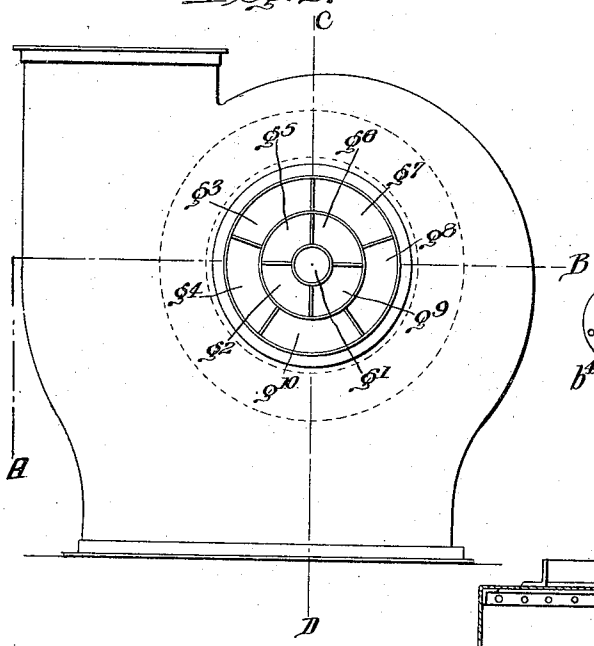


Fig. 5.

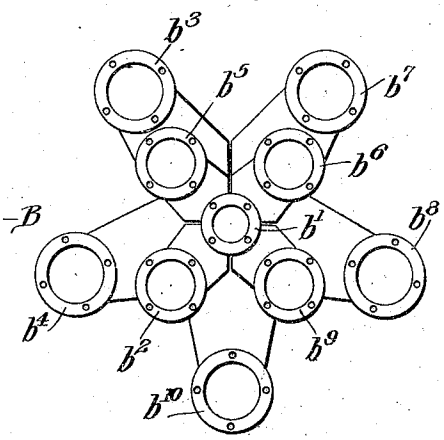


Fig. 3.

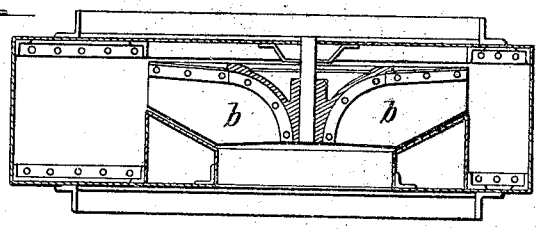
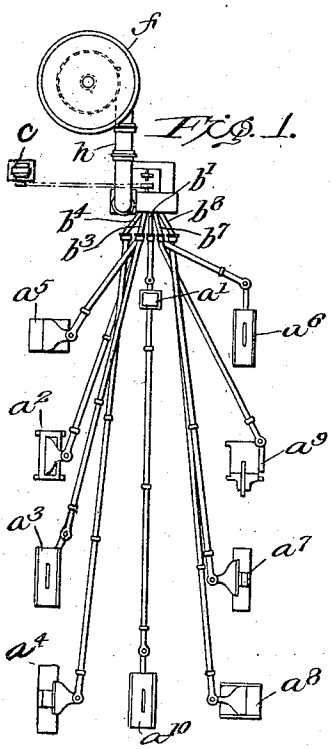


Fig. 1.



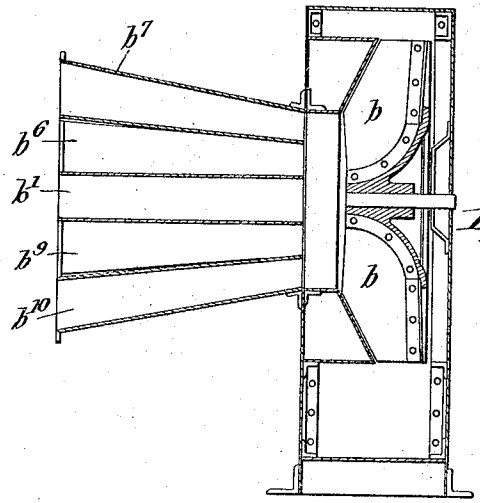


Fig. 4.

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SUCTION APPARATUS.

1,191,237. Specification of Letters Patent. Patented July 18, 1916.

Application filed March 4, 1914. Serial No. 822,538.

To all whom it may concern:

Be it known that I, MORITZ ROSENTHAL, a subject of the Emperor of Austria-Hungary, and a resident of Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Suction Apparatus, of which the following is a specification.

Suction apparatus for collecting dust, smoke, shavings or the like, generally include an exhaust or suction fan and a common suction duct having inlets at different distances from the fan or suction creating device. Such apparatus, however, presents the disadvantage that at the inlets to the conduit which are situated relatively remote from the fan or suction device, the suction effect is relatively small and considerably less than at points nearer the exhaust fan. With a view to overcoming this disadvantage, it has been proposed to increase the speed of the suction fan and to introduce adjustable valves at the several inlets or branches from the main duct and also to make the inlets situated at a distance from the fan of greater area than those nearer thereto. All of these constructions, however, failed to provide an apparatus which would insure a uniform suction action at varying distances from the fan. Increasing the speed of the fan will not change the relative difference between the suction effects produced at two points situated at different distances from the fan and the application of slide valves has many practical objections. For instance, such valves interfere with the action of the apparatus when employed for moving certain classes of material, for example wood shavings.

The object of the present invention is to provide a suction apparatus which will be free from the above noted objections and which is based upon the principle that the suction effect produced by a rotary fan depends upon the peripheral velocity of the fan, and as this velocity varies or increases in proportion to the length of the radius of the fan, a more powerful suction effect is necessarily produced adjacent the periphery of the fan blades than at points nearer the center or axis thereof.

According to the present invention, the suction apparatus is provided with a plurality of conduits or ducts and the connections between said ducts and fan are such that a greater suction effect is produced in the longer duct or ducts than in those of less length.

In the accompanying drawing, Figure 1 is a diagrammatic view illustrating an embodiment of the invention; Fig. 2 is an elevation of the fan casing, on an enlarged scale, with the connections for the several suction conduits removed; Fig. 3 is a sectional view, on the line A—B of Fig. 2; Fig. 4 is a sectional view on the line C—D of Fig. 2; Fig. 5 shows the relative positions and nature of the connections between the several suction conduits and fan casing.

In the embodiment of the invention illustrated means are provided for removing dust and so forth from ten machines, for example wood working machines, conventionally illustrated at a^1, a^2, a^3, a^4, a^5, a^6, a^7, a^8, a^9 and a^{10}. As shown the several machines are situated at different distances from a rotary suction or exhaust fan b and each is separately connected with the casing of said fan by a suitable conduit. The inlet to the fan casing is divided into spaces corresponding in number to the machines a^1—a^{10} and arranged as shown particularly in Fig. 2. All of the spaces g^1, g^2, g^3, g^4, g^5, g^6, g^7, g^8, g^9, g^{10}, are situated in the same plane, the space g^1 being at the axis of the fan and the others arranged around such central space as shown.

The conduits from the several machines a^1—a^{10} are connected respectively with the spaces g^1—g^{10} by connections b^1, b^2, b^3, b^4, b^5, b^6, b^7, b^8, b^9, b^{10}, the radial distance of the space g^1—g^{10} and connections b^1—b^{10} from the axis of the fan corresponding relatively to the distance from the associated machine a^1—a^{10} to the inlet to the fan casing.

As shown the fan b is driven from a motor c and the outlet therefrom is connected by a conduit h with a settling and collecting chamber or casing f.

The operation of the apparatus will be readily understood from the foregoing description and drawing, the latter, as previously noted, being largely diagrammatic.

Among the advantages of such an arrangement may be noted the following: A single exhaust fan or suction device is adapted for use with suction conduits of different lengths and capable of causing air to travel at different speeds in the different ducts. This permits of the use of exhaust

fans of less diameter than have been required in apparatus designed to accomplish a certain amount of work, thereby saving or reducing the driving power and enabling the dust separators combined with such an apparatus to be reduced in size. By this invention it is possible to have a direct connection between the casing of the exhaust or suction fan and each of a series of widely separated points and a more powerful suction effect can be obtained at a given distance from a fan of any size than is possible when the connections between the fan and several points at which the suction effect has to be applied are effected in the manner heretofore commonly followed.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a suction apparatus, the combination with a rotary exhaust or suction fan, of a plurality of throats communicating with the fan casing at different distances from the fan axis, for the purpose described.

2. A suction apparatus comprising a plurality of suction conduits of different lengths, suction means, and connections between said conduits and suction means whereby air, etc., will be caused to travel at higher speed through a relatively long conduit than through a shorter one.

3. In a suction apparatus, the combination with a rotary exhaust or suction fan, and a plurality of conduits of different lengths, of means connecting said conduits with the fan casing, each conduit being connected with the casing at a distance from the axis of the fan depending upon the relative length of the conduit, for the purpose described.

4. In a suction apparatus, the combination of a rotary exhaust or suction fan, having a plurality of suction throats arranged at different distances from the axis of the fan, and a plurality of conduits of different lengths connected with said throats, the shorter conduits being connected with throats relatively nearer the axis of the fan than the throats connected with the longer conduits, for the purpose described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MORITZ ROSENTHAL.

Witnesses:
HUGO REIK,
AUGUST FUGGER.