June 20, 1939. W. KAGAN 2,163,242

APPARATUS FOR MAGNETICALLY CLEANING COTTON

Filed May 14, 1938 2 Sheets-Sheet 1

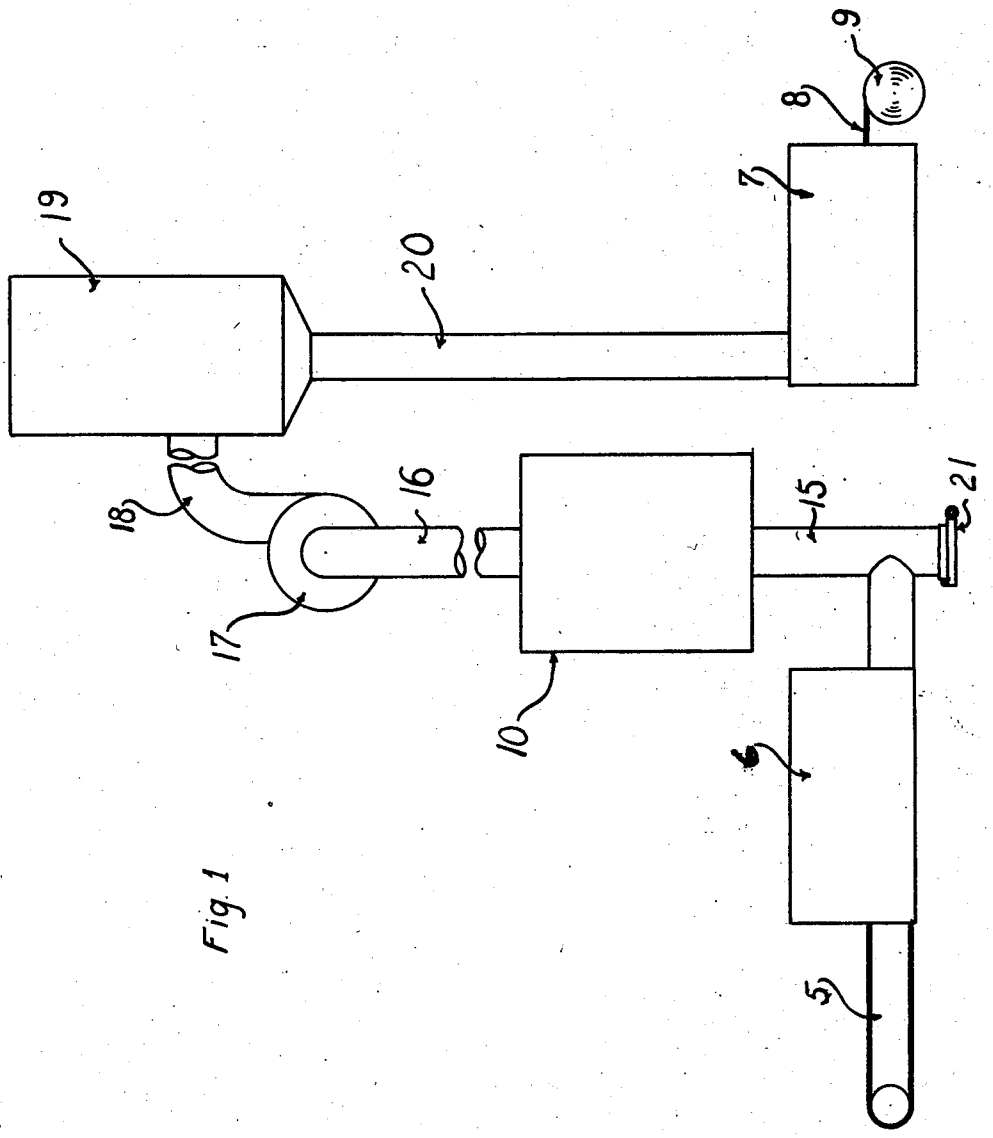


Fig. 1

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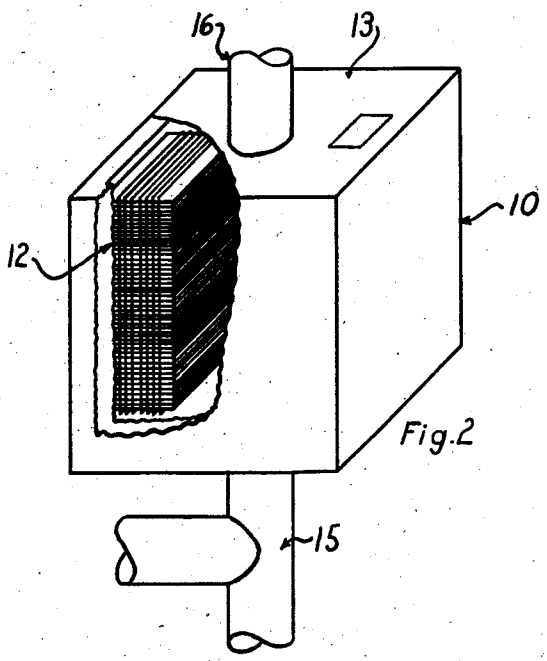


Fig.2

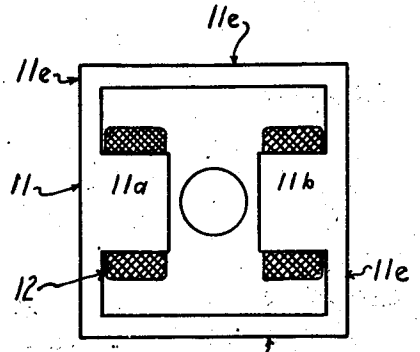


Fig.3

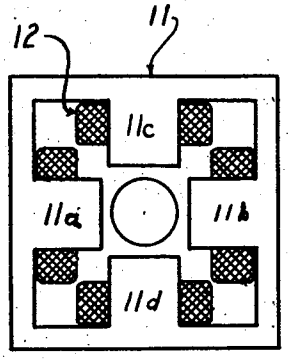


Fig. 4

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UNITED STATES PATENT OFFICE

2,163,242

APPARATUS FOR MAGNETICALLY CLEANING COTTON

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Application May 14, 1938, Serial No. 207,867

2 Claims. (Cl. 19—67)

This invention relates to means and methods for cleaning raw cotton, as freed from the bale and broken up in the willow machine and passed thence to the Garnett machine. Cotton as gathered and baled and then shipped, quite generally collects numbers of small particles and splinters of metal, including small nails and tacks, which particles if passed into the Garnett machine are very injurious to the teeth of that machine.

It is an important object of the present invention, therefore, to provide a means for efficiently separating from the loose cotton, as conveyed from the willow machine to the Garnett machine, all such metallic particles as may be involved therewith. Another object is to provide in combination with an air chute or tube for conveying the said cotton in loose and broken form from the willow to the Garnett machine where it is combed and processed, a closed box-like magnetic chamber incorporated in and constituting part of this conduit, the said chamber or cabinet having arranged laterally therein two or more magnets with the pole faces vertically positioned in spaced relation, with means provided such as a suction fan for drawing the cotton stream vertically up through this chamber and between the said magnets, whereby due to the relative heaviness of the metal particles referred to, their upward movement is retarded as compared with that of the cotton itself, and this retardation enables the magnets to exercise their attractive force by drawing off these particles to the poles of the magnets, where they adhere until the electric current operating the magnets is cut off, after which the accumulated particles drop into a drawer or tray provided for that purpose.

With the foregoing and such other objects and advantages in view as may appear from the following specification, attention is now directed to the accompanying drawings, constituting part of the specification, and wherein:

Figure 1 is an assembly view of my invention as incorporated in operative association intermediately of a willow machine and a Garnett machine, in the processing of cotton.

Figure 2 is an enlarged, perspective view of the main element of my invention, the magnetic housing and internal poles, a section of the housing being broken out to show the internal arrangement, sections of the lead in and lead out conduits being also shown.

Figure 3 is a top plan view of magnetic housing and internal integrally formed poles, the upper cover of the housing being removed.

Figure 4 is a plan view of a four pole structure and arrangement of magnets in lieu of the bi-polar structure of the preceding forms shown.

Cotton as freed from the bale is ordinarily passed through a conveyor of some sort such as the tube 5 to the conventional willow machine 6 where it is further broken up into relatively small pieces or flakes, and is passed thence directly into the Garnett machine 7 where it is combed with rotary toothed combs and passed in the form of a flat ribbon 8 out onto a roll 9, ready for the market. The willow and Garnett machines are conventional structures and hence further description is unnecessary here. The combs referred to of the Garnett machine comprise fine metallic points or spurs which are very liable to injury or destruction through metallic particles of any kind passing into said machine.

The present invention provides a simple and practical means for drawing out the said metal particles from the cotton before the cotton enters the Garnett machine. The invention comprises a housing 10 built up of a plurality of laminations 11 of magnetic material such as silicon iron, each one of the laminations being formed to include two or more internally positioned pole webs or extensions such as indicated at 11*a*—11*b* in Figure 3, or 11*a*—11*b*—11*c*—11*d* in Figure 4, held positioned in an operative spaced relation by the integrally formed and laterally disposed connecting webs 11*e*. These laminations are laid up in a conventional manner to complete the four walls of the structure, and the several poles are then wound in conventional manner with the windings 12 which are connected in series with any suitable source of electrical energy such as a generator (not shown). End covers 13 are then seated over the top and bottom ends of the structure as formed, these covers being apertured for engaging the open ends of pipes or conduits 15 and 16. The magnetic housing 10 with the poles formed therein as stated is positioned in the conduit line leading from the willow machine, this line being directed vertically as shown at 15 and the housing being located at a suitable point in the line so that the pole faces of the internal magnets will stand vertically and the intervening space between the magnets will constitute in practice a straight continuation of the conduit passage-way. The upper pipe or conduit 16 leads from the upper side of the housing to a suction fan 17 of conventional structure, and still another pipe extension 18 leads from the fan to an inclosed chamber 19. A delivery conduit or pipe 20 leads from the bottom of the chamber 19

to the Garnett machine which is represented generally at 7. The lower end of the pipe 15 is provided with a hinged cap or door 21. As indicated in the drawings either a two-pole or four-pole inclosed magnetic structure may be employed, although it is thought that the bi-polar structure is the more practicable.

In the operation of the apparatus as described, the loose cotton passes upwardly through the housing or inclosed magnetic chamber 10, where owing to the relative weight or heaviness of the metal particles involved or intermixed with the cotton, those particles are relatively retarded and are drawn aside to the poles of the magnets within the said housing. The particles accumulate on those poles and when the electric current is opened, they fall off and lodge upon the door 21, whence they may be cleaned off as occasion may require.

While I have herein set forth and described a preferred embodiment of my invention, and have shown certain preferred structural features thereof, it is understood that I may vary from the same in minor details for the purpose of providing a practical apparatus for the purpose intended, not departing however from the essence of the invention as defined in the appended claims.

I claim:

1. In an apparatus of the kind described, a vertically arranged conduit, a clean-out door at the lower end of the conduit, an electro-magnetic housing interposed in the conduit and forming a continuation of the conduit, the housing having magnet poles protruded interiorly at opposite inner walls and in a spaced relation with the intervening space between the poles forming a vertical continuation of the conduit, a blow chamber connected at the upper end of the conduit, a delivery conduit leading downward from the bottom of the blow chamber, and means for propelling a stream of loose cotton upwardly through the conduit and magnetic housing into the blow chamber whence it will fall by gravity through the delivery conduit.

2. In a structure as defined in claim 1, a willow machine connected at the lower part of the vertical conduit for delivering loose cotton into the conduit, and a Garnett machine connected at the lower end of the delivery conduit for receiving the cotton from the blow chamber.

WILLIAM KAGAN.