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## (54) Separating apparatus.

(57) An apparatus for separating bird seed from lighter waste material such as chaff and feathers wherein a flow of air is drawn through the apparatus and the mixture is introduced into the air flow which carries away the lighter chaff and feathers, but the heavier seed and whole grain is not and is therefore separated. The air flow carrying he lighter material is caused to pass round a sharp corner defined by the edge of a partition plate contained in a separation chamber. The lighter material does not pass round the sharp corner, and the lighter material drops into a collection drawer. The mixture is fed into the top of a downwardly directed feed chute and from the bottom of the feed chute the mixture passes into the air flow in the upwardly extending lift channel, the bottom of which is open to allow air to be drawn in and the heavier material to drop out.

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# Separating Apparatus

This invention relates to separating apparatus for separating heavier particles/granules or the like from lighter particles/granules/waste matter or the like.

The invention has particular application to the recycling of foodstuffs for animals and birds as such foodstuffs may become intermixed with waste matter and separation of waste matter is desirable. It is envisaged that the invention will typically be utilised by bird breeders who feed their stock primarily on seed or grain. Such seed or grain is generally scattered on the ground or placed in containers and during the course of feeding some of the seed or grain is displaced by the birds and intermixed with waste matter such as chaff from the seeds or grain, feathers, dust and grit and consequently is not consumed by the birds.

Invariably valuable quantities of whole seed and grain are lost in this way because separation of the remaining whole seed and grain from the waste matter is a difficult and uneconomical operation and heretofore the waste and grain remaining have simply been thrown away.

It is desirable to provide a means for the separation of remaining whole seed and grain from waste matter, and in particular waste matter of a relatively light weight such as chaff, feathers or dust, which is much bulkier than the heavier material. It is recognised that the presence of an amount of grit in foodstuffs is acceptable to birds and indeed grit forms part of the diet of many species, whereas chaff, feathers and dust are of no value and serve to make the foodstuff unpalatable.

The object of this invention is to provide apparatus for the separation for example of whole seed and grain from lighter weight waste matter so that the whole seed and grain may be re-used.

According to the invention there is provided separation apparatus for separating heavier material from lighter material wherein said materials in mixed form are introduced into a flow of gaseous medium flowing at such a rate to carry off the lighter material but not the heavier material to achieve the separation.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings, wherein:-

Fig. 1 is a perspective view of an apparatus according to the embodiment of the invention;

Fig. 2 is a sectional view of the apparatus according to Fig. 1, taken on line II - II of Fig. 3; and

Fig. 3 is a sectional view taken on line III - III of Fig. 2.

Referring to the drawings, in Fig. 1 the apparatus is shown in perspective elevation, and will be seen to comprise a closed casing having a top 10, large side walls 12, 14, narrow end walls 16, 18, and a base 20, all defining a separation chamber. At the bottom end of the separation chamber is provided a removable drawer 22, and inside the separation chamber is a separation partition 24 which extends from the top 10 to a point approximately mid-way of the height of the separation chamber.

The top 10 is provided with an outlet 26 to which a source of suction is in use applied, whilst in the side wall 16 near the top 10 is provided an inlet 28 through which the air is drawn as a result of applying suction the outlet 26.

As best seen in Fig. 2, the inlet 28 is connected to a feeding structure 30 which comprises a feed chute 32 of tapering cross-section from top to bottom as shown in Fig. 2, and a lift channel 34. The feed chute 32 is opened at the top to allow the insertion thereinto of the mixture of heavy grain and seed material, and the lighter chaff and feathers. At the lower end of the chute 32 is an outlet 36 whereby the chute communicates with the lift channel 34 at the lower end thereof. The lift channel 34 is open at the lower end 38 so that air can be drawn thereinto as indicated by arrow 40 so that a flow of air through the apparatus takes place as indicated by arrows 40, 42, 44, 46, 48 and 50. It will be seen as indicated by arrows 40 and 42 that the air is drawn up through lift channel 34 and the mixture is also drawn up through this channel, the flow of air being such that the valuable heavier particles in this case seed, whole grains and perhaps some grit, overcome the air flow and drop out of open end 38, and are caught in a drawer or container or the like, and can be re-used. The lighter material in the air flow 42 to 50 is drawn as indicated by arrow 44 through inlet 28 into the separation chamber, and then the air is drawn sharply round the lower edge of the partition plate 24, at which point the lighter and bulkier material separates out by centrifugal separation and in fact drops into the drawer 22 where it collects as indicated by reference 52. Any lighter material carried as indicated by arrows 48 and 50 out of the outlet 26 will only be very light dust. The drawer 22 can be removed and the lighter material, in this case chaff and feathers, disposed of. The appartus therefore works on a two stage separation process, the seed and grain dropping from the outlet 38 and the chaff and feathers being separated out in separation chamber.

As shown in Fig. 2, the chute 32 can have its width controlled by means of a slidable plate 56 which can be slid in and out relative to the chute transverse direction as indicated by arrow 58.

Additionally, as shown in Fig. 3, under the slide plate 56 the cross-section of the chute 32 is reduced by inserts 60 and 62.

The apparatus is simple in nature and yet highly effective in operation. Chaff and smaller feathers are caught in drawer 22 and are effectively separated from the more valuable grain which can be re-used.

Typically, the inlet of a vacuum cleaner may be connected to the outlet 26 to provide the suction force, but the equipment can be provided with its own suction fan and, if required, air filtering arrangement similar to a vacuum cleaner. For example, a fan may be located in the separation chamber where indicated by dotted lines 100, to provide a self contained unit.

The entire apparatus may be constructed in synthetics plastics material.

Although in this embodiment of the invention the air flow through the apparatus is created by suction, in an alternative arrangement a blowing apparatus may be provided for blowing the air through the apparatus.

Although the apparatus is specifically designed for separating whole grain and seed (heavier materials) from feathers and chaff and dust (lighter materials) it can be used for separating the materials other than those specified.

## Claims

1. Separation apparatus for separating heavier material from lighter material wherein said materials in mixed form are introduced into a flow of gaseous medium flowing at such a rate to carry off the lighter material but not the heavier material to achieve the separation.

2. Apparatus according to Claim 1, comprising a separation chamber from which air is sucked to create said flow of gaseous medium, said chamber comprising an outlet for the gaseous medium, an inlet for drawing in the gaseous medium, and lighter material, and a partition means defining a flow path for the gaseous medium which causes the gaseous medium to execute a sharp turn around which the gaseous medium is drawn, but the lighter material is separated.

3. Apparatus according to Claim 2, wherein said means comprises a partition plate extending downwards from the top of the chamber and said inlet and outlet are located at the top of the chamber at opposite sides of said plate.

4. Apparatus according to Claim 3, including an infeed chute with which the mixture of heavier and lighter material is fed, said infeed chute having an outlet at the lower end thereof, leading to the lower end of a lift channel, said lift channel having an outlet at the top end thereof which leads to or forms the inlet to the separation chamber.

5. Apparatus according to Claim 4, wherein the lower end of the lift channel is open to allow the gaseous medium to be drawn thereinto and the heavier material to fall therethrough.

6. Apparatus according to Claim 5, wherein there is an adjustable gate in the feed chute in order to vary the rate of feed of the mixture of materials to the feed chute outlet.

7. Apparatus according to Claim 6, wherein said gate is adjustable by being slidable transversely of the chute.

8. Apparatus according any of Claims 2 to 7, wherein the bottom of the separation chamber is provided with a drawer, which serves to collect the separated, lighter material and is removable so that the lighter material can be collected therefrom.

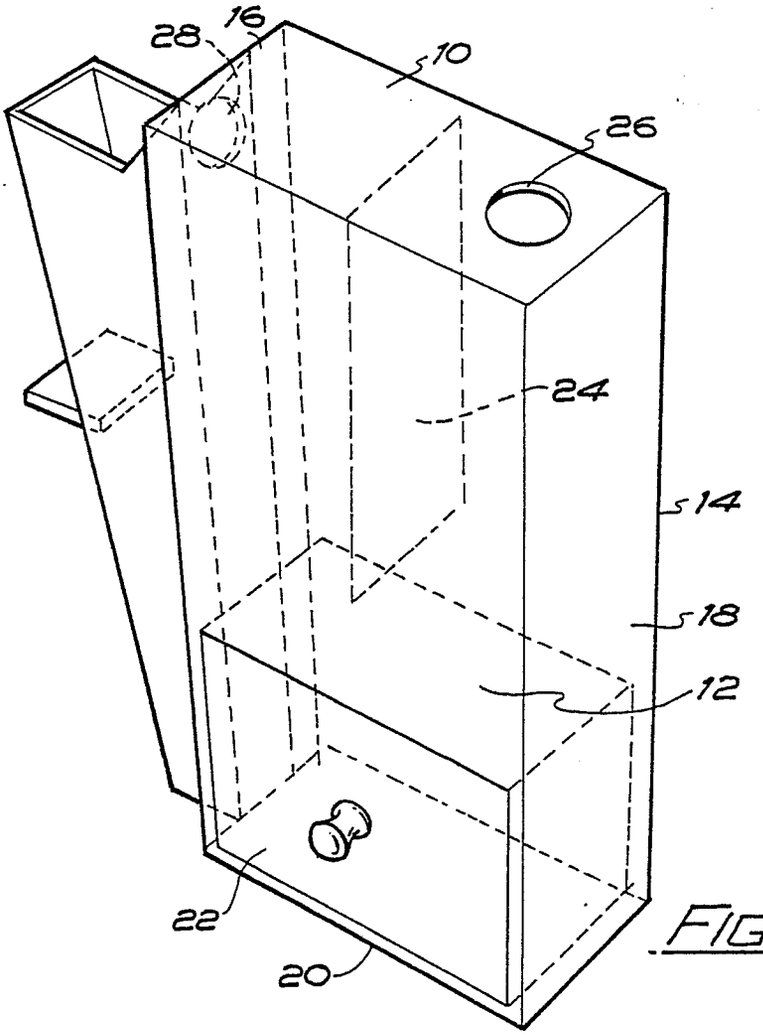


FIG. 1

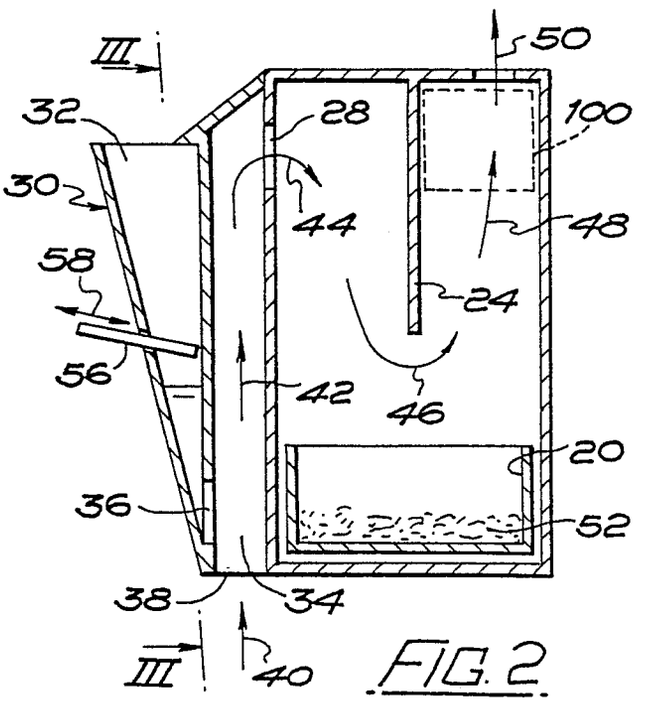


FIG. 2

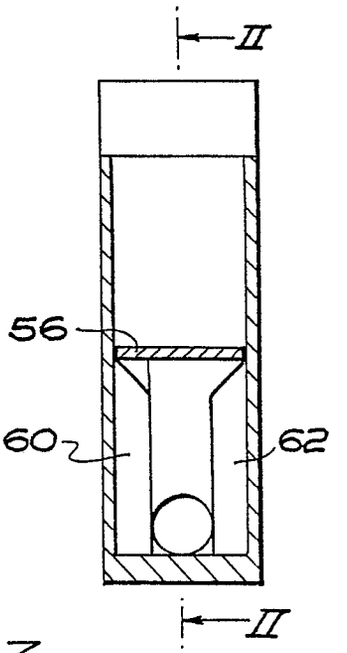


FIG. 3