United States Patent [19]

Schoeb

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[45] **Aug. 13, 1974**

[54] **PNEUMATIC FEEDER FOR PLURAL MAKER SYSTEMS**

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[73] Assignee: **Brown & Williamson Tobacco Corporation,** Louisville, Ky.

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[52] **U.S. Cl.** **302/28,** 198/76, 198/232

[51] **Int. Cl.** **B65g 53/04**

[58] **Field of Search** 302/28, 42, 56; 198/57, 198/58, 76, 232; 222/330

[56] **References Cited**

UNITED STATES PATENTS

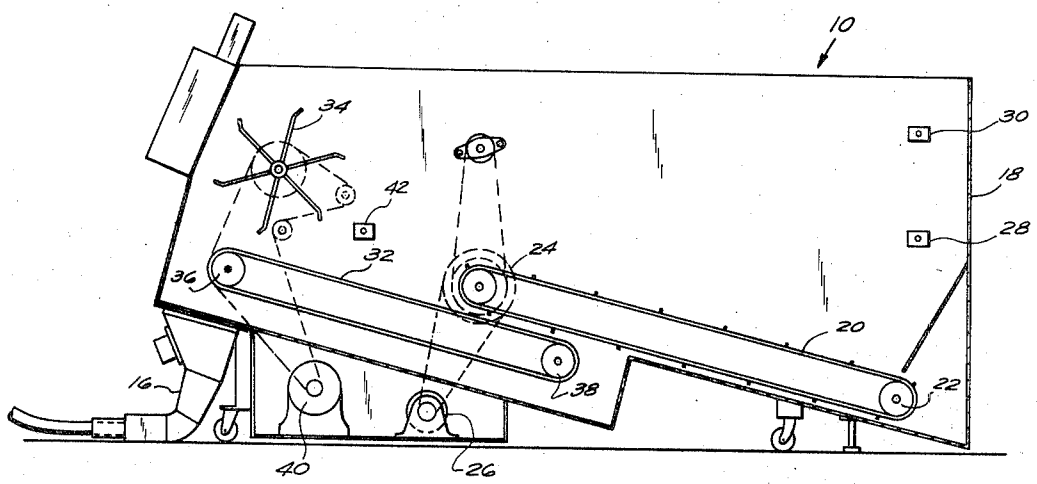
1,468,966	9/1923	Herington	302/42
2,827,333	3/1958	Wallin	302/42 X
2,920,355	1/1960	Clark	198/57 X
2,948,569	8/1960	Bodner	302/28
3,414,330	12/1968	Trutzschler	302/28

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Assistant Examiner—Hadd Lane
Attorney, Agent, or Firm—Finnegan, Henderson, Farabow & Garrett

[57] **ABSTRACT**

A tobacco feeder is coupled to two multiple cigarette maker systems through two tubes, one for each system. The feeder is driven by a two-speed motor. When only one system requires tobacco, the feeder is driven at low speed, whereas it will be switched to the higher speed when both systems require tobacco simultaneously.

6 Claims, 4 Drawing Figures



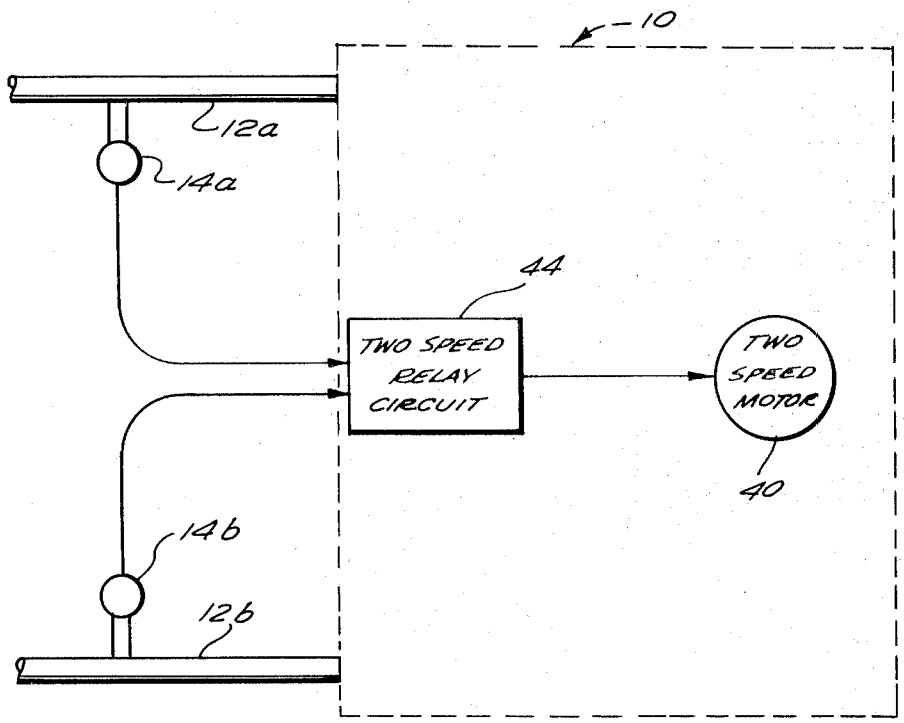

10
12a
14a
44
TWO SPEED RELAY CIRCUIT
TWO SPEED MOTOR
40
14b
12b

FIG. 1

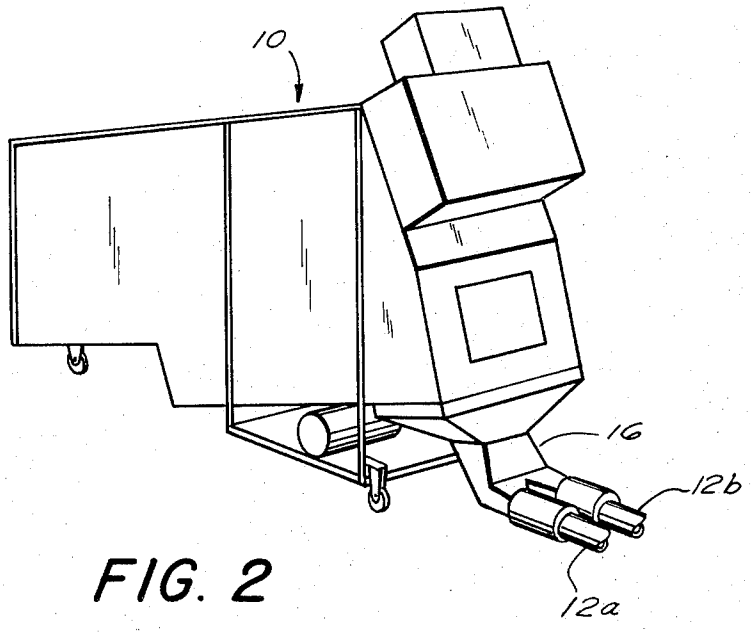

10
16
12b
12a

FIG. 2

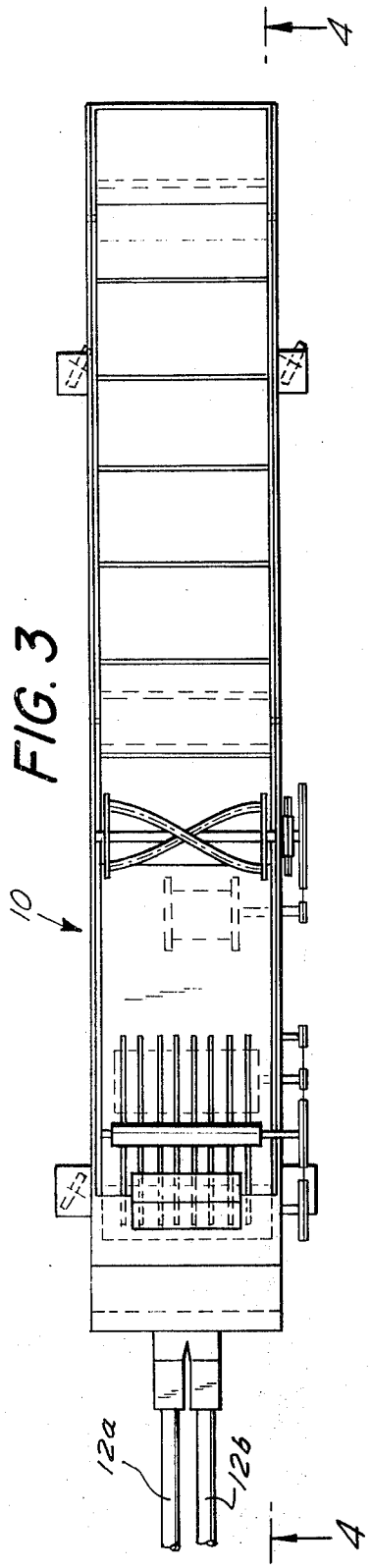


FIG. 3

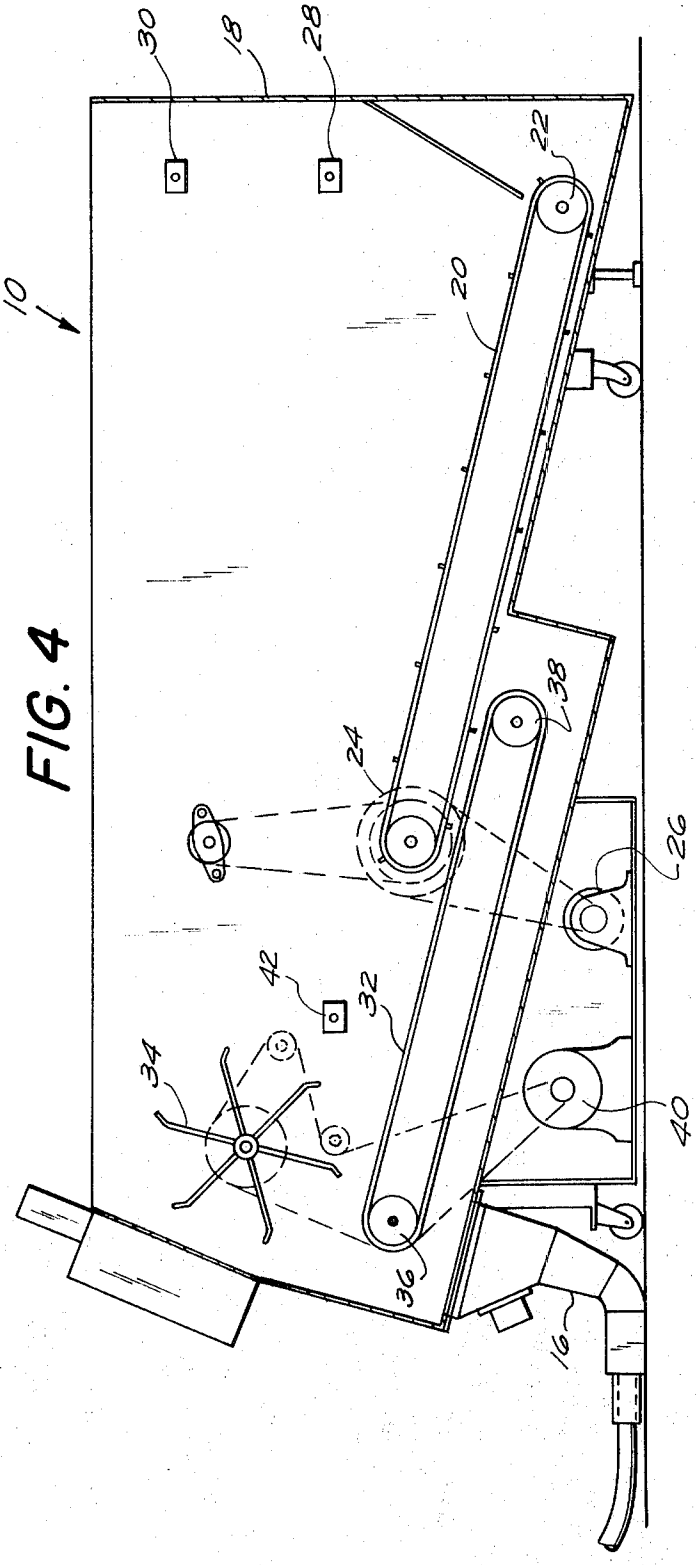


FIG. 4

PNEUMATIC FEEDER FOR PLURAL MAKER SYSTEMS

BACKGROUND OF THE INVENTION

In commonly assigned U.S. Pat. No. 3,386,773, granted June 4, 1968, a pneumatic tobacco feed system is disclosed which utilizes individual feeders for pneumatically feeding tobacco to a single system or bank of cigarette makers through a main feed tube or pipe. In actual practice, a single feeder will ordinarily feed ten cigarette makers. As the number of cigarette makers increases, naturally more feeders are required. Available space eventually becomes scarce and a problem is therefore created in accommodating the required number of feeders. Again, capital expenditure for feeders becomes a significant factor. These problems are compounded by modern trends in cigarette merchandising of a large number of different varieties of brands of cigarettes. Each brand requires an individual feeder. In this connection, more than one brand of cigarettes may also be run on one bank or system of makers. Another factor requiring upgrading of the feeder technology is the introduction of relatively high speed cigarette making machines which require increased through-put of the tobacco feeders.

SUMMARY OF THE INVENTION

The present invention relates to a pneumatic feeder for feeding one or both of two multi-cigarette maker systems or banks.

The principal object of the present invention is to utilize one feeder for feeding two tobacco conveying pipes, with each pipe leading to a multi-cigarette maker system.

Another object is to effectively double the output of a pneumatic feeding system of the foregoing type.

A further object is to significantly decrease the space requirements, and at the same time maintain at a minimum all costs of equipment and installation of a pneumatic feeding system of the foregoing type.

Still another object is to provide a feeder with relatively increased tobacco through-put for modern high speed cigarette making machines.

Other objects and advantages will become apparent from the following detailed description which is to be taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagramatic view showing the manner in which the feeder of the present invention is coupled for actuation with the pair of main feed pipes leading to the independent maker systems;

FIG. 2 is a front perspective view of the feeder and the associated pair of feed pipes;

FIG. 3 is a top plan view of the feeder; and

FIG. 4 is a longitudinal sectional view of the feeder taken along the lines of 4—4 of FIG. 3.

DETAILED DESCRIPTION

The pneumatic system disclosed in the above referenced patent and to which the present invention is related is designed to convey cut tobacco from tobacco storage areas to making machines automatically and as required by the making machines. Ordinarily, a sensing device in each making machine hopper operates to detect a low level of tobacco. A request is then made by this particular cigarette making machine for more tobacco. Air flow is established in the pneumatic feed system and when a prescribed conveying velocity is reached, the feeder is energized and tobacco flow is established between the storage area and the selected making machine. At this machine, a tobacco discharger of the type disclosed in U.S. Pat. No. 3,386,773 or 3,580,644 receives the tobacco and separates it from the air stream. When the desired amount of tobacco has been collected by the discharger, the feeder is deenergized and the collected tobacco is discharged into the associated making machine hopper.

In the drawings, the pneumatic conveying system of the type disclosed in U.S. Pat. No. 3,386,773 will include a cut tobacco storage area at which is located feeder **10** incorporating the teachings of the present invention for feeding tobacco to the cigarette making machine systems connected with main feed pipes **12***a* and **12***b*. The operation of feeder **10** is controlled by means of pressure differential switches **14***a* and **14***b* associated with the respective main feed pipes **12***a* and **12***b*. Whe the air flow within these feed pipes reaches conveying velocity following a demand signal from a cigarette maker, the pressure differential switch **14***a* or **14***b* as the case may be senses this condition and causes the feeder **10** to be energized. If there be a demand for tobacco to be conveyed through both lines, **12***a* and **12***b*, feeder **10** will operate at higher speeds to increase its output to satisfy this demand. This aspect of the invention will be discussed in greater detail shortly.

The main feed pipes **12***a* and **12***b* are both connected directly to a dual discharge chute **16** which is at the outlet end of the feeder **10.** This chute **16** is disclosed in commonly assigned patent application Ser. No. 288,569, filed on even date herewith and entitled "Transition Chute." It will suffice to say that the chute **16** is designed to direct the tobacco of the feeder **10** into the main feed pipes **12***a* and **12***b* individually as well as simultaneously, both efficiently and without clogging, blockage or choking of the passageways by the tobacco.

The feeder **10** includes a hopper **18** which receives the tobacco to be conveyed to the cigarette makers. Interiorly of the hopper **18** is conveyor belt **20** extending over suitably journaled pulleys **22** and **24**, one of which is suitably connected with the output shaft or motor **26.** Photocells **28** and **30** are employed to regulate the feed of tobacco into the hopper **18,** the former initiating the feed, while the latter cuts it off. The belt **28** is adapted to transfer tobacco onto a metering belt **32,** forming part of a metering section which also includes a doffer **34,** both of which cooperate in transferring tobacco into the chute **16.** The metering belt **32** is mounted on rollers **36** and **38,** and together with doffer **34** is driven by two-speed motor **40.** The photocell **42** is conveniently located behind the doffer **34** and operates to sense the amount of accumulation of tobacco on the belt **32.** When this accumulation is low, the motor **26** is actuated to operate belt **20** and when the accumulation reaches the level of the photocell, the motor **26** is deactivated to stop the movement of the belt **20.** The motor **40** in a successful application of the present invention was a General Electric two-speed motor identified as an integral parallel shaft, gear motor, frame No. K145tb229, 1½ or ¾ horsepower, 125 or 62.5 rpm output, drip proof enclosure with electrically released

disc-type brake. A two-speed relay circuit **44** interposed between the two-speed motor **40** and the pressure sensing switches **14***a* and **14***b* operates to actuate either the low speed or high speed side of the motor **40**, depending upon whether one or both of lines **12***a* and **12***b* respectively are calling for tobacco. The circuit **44** in accordance with the successful embodiment was a Cutler - Hammer No. 973hl0911 two-speed single winding magnetic starter circuit. The motor **40** either cuts off or increases the feed of tobacco instantly. The instant transition from low to high speed minimizes "starving" of the demanding makers and high to low speed eliminates choking of the chute **16** by the tobacco.

Thus, when a cigarette maker demands tobacco, the pressure switch **14***a* or **14***b*, as the case may be, senses when conveying velocity is reached to actuate the relay circuit **44** to energize the low speed side of the motor **40.** If there is a call for tobacco at any time by both lines **12***a* and **12***b* as the result of the actuation of pressure sensing switches **14***a* and **14***b*, the relay circuitry **44** will instantly energize the high speed side of the motor **40.** When going from high speed to low speed, it is preferred that there be a temporary braking in the motor **40.**

It is also contemplated by the present invention to couple feeder **10** to more than one maker system in which case more than two feed tubes or pipes **12** will be employed. Similarly, motor **26** may be of the variable speed variety where multiple speeds are desired.

Thus, the several aforenoted objects and advantages are most effectively attained. Although a single, somewhat preferred embodiment of the invention has been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

I claim:

1. A system for feeding tobacco from a supply source to at least two cigarette making machines, said system comprising:

a. a frame,

b. a transition chute operatively associated with said frame and having tobacco receiving and discharge end portions,

c. at least one conveyor belt assembly, operatively mounted to said frame and associated with said chute, said assembly comprising a conveyor belt having an input end and a discharge end, said discharge end being positioned above said chute to drop tobacco in the receiving end portion of the transition chute, said assembly further comprising means for operatively supporting said belt and means operatively connected to the belt for driving said belt, said driving means including a multi-speed motor having at least two speeds for driving the conveyor belt at least at a first speed and second greater speed to vary the feed rate to the transition chute, the conveyor assembly further including a braking means operatively connected to said motor for instantly braking the driving action of said motor during shifts from the second greater speed to the first speed when a shift occurs from feeding through two pipes to feeding through one pipe and to instantly stop said driving action when the demand ceases to limit further accumulation of tobacco in said chute to that already delivered from the conveyor and falling into the chute,

d. at least two feed pipes operatively connecting the discharge end portion of said transition chute to respective cigarette making machines, said pipes being in communication with the interior of said chute to draw tobacco from said chute as the tobacco is deposited thereby the conveyor belt assembly and upon demand by the cigarette making machines,

e. means operatively connected to said feed pipes for creating desired air pressure therein to draw the tobacco from the transition chute through said pipes to the cigarette making machines,

f. valve means operatively mounted in each of said feed pipes to selectively open and close said pipes in response to demand levels at the cigarette making machines, and

g. means connected to said feed pipes for actuating said motor at said first speed when only one of the pipes is supplying tobacco, at said second speed when both of said pipes are supplying tobacco and to cease operation when neither pipe is supplying tobacco, said speed transitions and cessation being instantaneous to prevent starving of tobacco or choking of tobacco in the chute.

2. The invention in accordance with claim **1** wherein the means for actuating said motor include a relay circuit coupled with the motor for actuating the motor at the multi-speeds and at least two air pressure sensitive means coupled with the relay circuit for sensing the air pressure in the respective pipes and each adapted to be actuated when there is a demand for tobacco in the associated pipe.

3. The invention in accordance with claim **1** wherein the transition chute has a single enlarged entrance end for receiving tobacco and a pair of outlet pipes for transferring the tobacco to the main feed pipes.

4. The invention in accordance with claim **3** wherein the conveyor belt assembly, includes a belt conveyor having a hopper end and a discharge end for transferring tobacco to a metering station, and a metering conveyor at the metering station driven by the multi-speed motor means for receiving the tobacco discharged by the belt conveyor and transferring it to the chute.

5. The invention in accordance with claim **4** wherein level sensing means are provided for sensing the level of the tobacco on the metering conveyor and when the level exceeds a predetermined limit the operation of the belt conveyor is stopped.

6. The invention in accordance with claim **5** wherein a doffer is driven in synchronization with the metering conveyor.

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