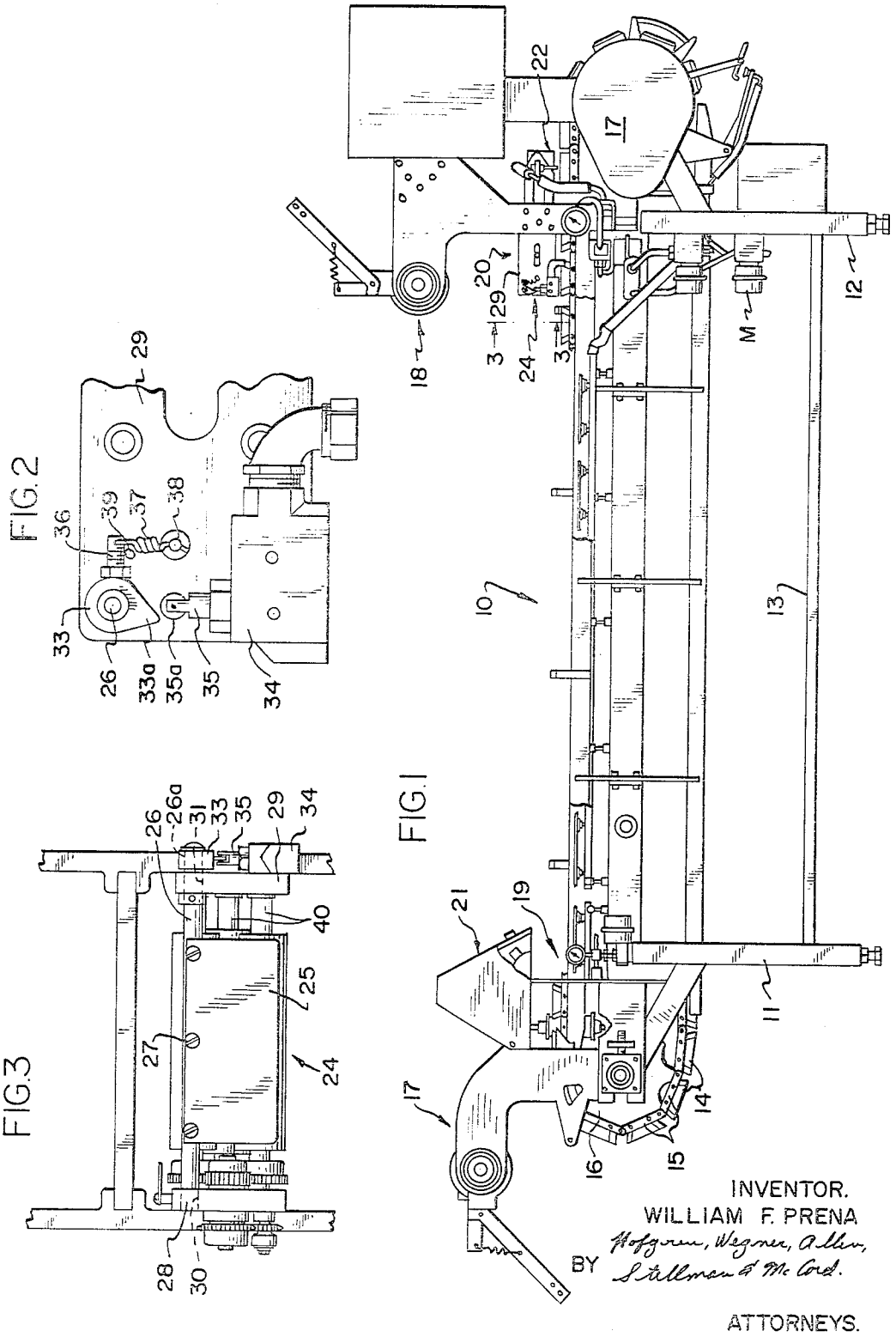
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SAFETY GATE FOR VACUUM PACKAGING APPARATUS

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SAFETY GATE FOR VACUUM PACKAGING APPARATUS

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ABSTRACT OF THE DISCLOSURE

Vacuum packaging apparatus wherein a plurality of product carrying receptacles are movable along an endless conveyor to a sealing station where a layer of film is heat sealed to a receptacle as the air within the interior thereof is withdrawn, including a safety gate pivotally mounted on support structure adjacent the sealing station for actuating a switch connected in circuit with the conveyor driving motor to interrupt the circuit to the motor when an extraneous article is placed on the conveyor.

Background of the invention

Vacuum packaging machines of the type described briefly in the above abstract are well known, and are typified by those disclosed in my co-pending application Ser. No. 588,423, filed Oct. 21, 1966, and in Myers application Ser. No. 516,559, filed Dec. 27, 1965. While such vacuum packaging machines have functioned in the desired manner to produce satisfactory evacuated packages, on occasion it has been found that extraneous articles have been placed on the conveyor and have advanced into the sealing station without being noticed and have resulted in severe damage to the sealing head.

Summary of the invention

The present invention provides an extremely simple, yet novel, means for detecting the presence of an extraneous article upon the conveyor of a vacuum packaging machine for actuating a switch means connected in circuit with the conveyor drive motor to stop the conveyor before the article is advanced into the sealing station.

Brief description of the drawings

FIG. 1 is a side elevational view of a vacuum packaging machine including the safety gate structure of the invention;

FIG. 2 is an enlarged fragmentary side elevational view of the motor controlling switch structure and the actuator therefor; and

FIG. 3 is an enlarged view looking generally in the direction of the arrows 3—3 in FIG. 1.

Detailed description of the preferred embodiment

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

The vacuum packaging machine of the present invention is similar in many respects to those disclosed in the above mentioned Myers and Prena applications, and the disclosures of these applications are hereby incorporated by reference in their entirety into this application.

Referring now to the drawings, a vacuum packaging machine **10** is shown to include a frame having spaced

uprights **11** and supporting an elongate beam **12** with brace members **13** extending between uprights **11** at the lower ends thereof. A plurality of compartment defining trays or receptacles **14** are mounted on an endless conveyor defined by a plurality of pivotally interconnected links **15**. The conveyor links **15** are trained over sprockets, such as shown at **16** at the rearward end of the machine, and the conveyor is driven from motor M by suitable drive means within housing **17**. The drive means may take the form of that disclosed in the above mentioned Myers application, and such drive means is arranged to intermittently move the conveyor in a clockwise direction as viewed in FIG. 1.

Spindle assemblies **17** and **18** are provided at the rearward and forward ends of the machine, respectively, and spindle assembly **17** is adapted to rotatably support and guide a first roll of film toward a film drawing station **19**, while spindle assembly **18** is adapted to rotatably support and guide a second roll of film toward a sealing station **20**. Film clamping members, not shown, are preferably provided at opposite sides of each tray **14** for clamping opposite edges of the film being fed from spindle assembly **17**. Tuckers, either fixed or movable, are also preferably provided for tucking the edges of the film from spindle assembly **17** under the film clamping members. A heater **21** is provided at the film drawing station **19**, and heater **21** heats the clamped film so that it is readily stretchable and can be drawn downwardly into the compartment within the tray **14** at the film drawing station **19**. The film from spindle assembly **18** is sealed around the periphery of the film in tray **14** at the sealing station **20** as the interior of the thus formed package is evacuated by a sealing and evacuating head **22**, which may take the form of the sealing and evacuating head disclosed in the above mentioned Myers application.

Article sensing means **24** is provided adjacent the path of movement of receptacles **14** immediately before the sealing station **20**. The article sensing means includes a generally rectangular gate **25** fixed to a transversely extending shaft **26** by screws **27** or the like. Shaft **26** is mounted for rotation in frame members **28** and **29** at opposite sides of the path of movement of the receptacles **14**, and for this purpose, frame mmebers **28** and **29** are provided with respective horizontally aligned openings **30** and **31** positioned above the path of movement of receptacles **14**. The lower edge of the gate **25** is positioned so as to just clear the upper surface of receptacles **14** as they are advanced into the sealing station **20**, so that any article that is left upon the receptacles will pivot gate **25** relative to the frame members **28** and **29**.

Shaft **26** includes a portion **26***a* that extends laterally outwardly of frame member **29**, and a switch actuator, in the form of a cam **33**, is fixed on the shaft portion **26***a*. A switch **34** is mounted on frame member **29** in vertical alignment with cam **33**, and switch **34** includes a movable plunger **35** for opening contacts within the switch that are connected in circuit with the conveyor drive motor M.

A spring mount, in the frame of an adjustable bolt **36**, extends outwardly of cam **33**, and a spring **37** is connected between bolt **36** and a lug **38** on frame member **29** to bias the shaft **26** in a clockwise direction (as viewed in FIG. 2) to position the bolt **36** in engagement with a stop **39** carried by frame member **29**. It will be understood that the spring **37** urges the gate **25** to a proper article sensing position with the lower end of the gate **25** being disposed immediately above the path of movement of receptacles **14** when the bolt **36** is positioned in engagement with stop **39**. When the gate **25** is engaged by an article resting upon receptacles **14**, the gate will be pivoted in a counterclockwise direction against the bias of spring **37**, and the enlarged cam portion **33***a* at the lower end of the cam **33** will engage a roller **35***a* carried at the upper end

of switch plunger **35** to depress the plunger, actuate the switch; and interrupt the circuit to motor M, thereby stopping the advancing movement of the receptacles **14** before the article on the receptacles can move into the sealing station.

In view of the fact that the sealing heads commonly used in vacuum packaging machines are complicated and expensive mechanisms, it will be appreciated that the simple, yet heretofore unobvious, expedient of providing a safety means for preventing damage to the sealing head is an extremely worthwhile innovation. Very often, during fabrication, initial installation, and servicing of vacuum pacakaging machines, it is common to place tools upon the receptacles **14**, and the safety means of the present invention effectively prevents inadvertently placed tools from damaging the sealing head. Additionally, the safety gate means of the present invention prevents a workman, or an individual placing articles within the receptacles **14**, from placing a hand within the sealing station, or in the rollers **40** which feed and guide film from supply **18** to the sealing station.

I claim:

1. In a packaging apparatus wherein product carrying receptacles are advanced along a path toward a work station where closure means is applied to a receptacle, frame structure adjacent said work station including, frame members at opposite sides of said path having horizontally aligned openings therein above said path, motor driven means for advancing said receptacles to said work station, switch means carried by one of said frame members for deenergizing the motor of said motor driven means to stop the advancing of said receptacles, and safety means positioned in said path before said work station for actuating said switch means upon engagement of said safety means by an extraneous article, said safety means comprising a gate carried by a shaft rotatably mounted in said openings for pivotal movement on said frame structure and having a switch actuator movable therewith and which is defined by a cam fixed to said shaft in vertical alignment with said switch means, the lower ends of said gate extending to a region immediately above said path so that extraneous articles left on said receptacles also will pivot said gate and actuate said switch, and spring means for biasing said gate toward an article sensing position.

2. Apparatus as set forth in claim **1** wherein said spring means is connected between said cam and said one frame member outwardly of said shaft.

3. Apparatus as set forth in claim **1** wherein an abutment is carried by said cam, and is engageable with a stop on said one frame member for properly locating the gate in an article sensing position.

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