Feb. 21, 1967 H. M. PREUSSER 3,304,825

TRIGGERING CONTROL FOR SEVERING DEVICE

Filed June 11, 1963

2 Sheets-Sheet 1

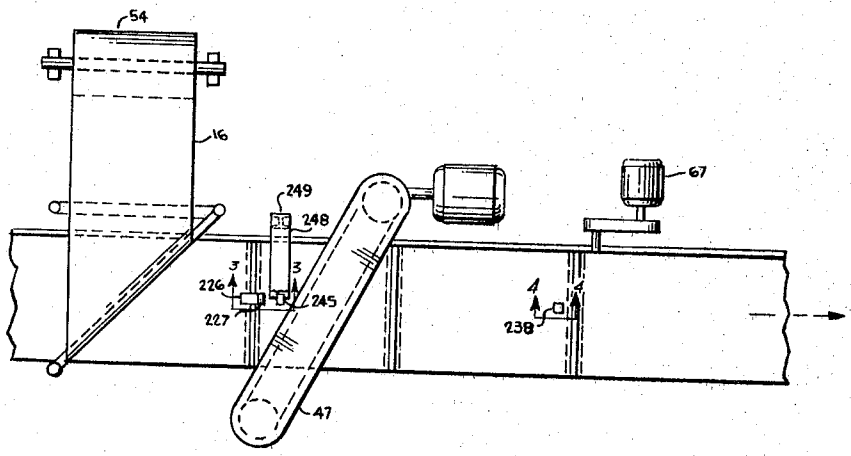


Fig. 1.

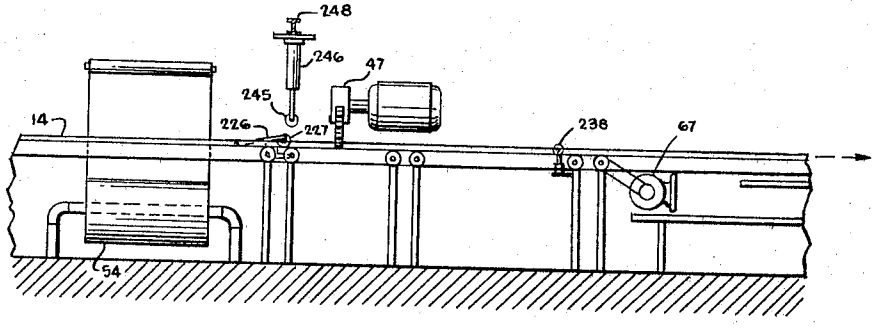


Fig. 2.

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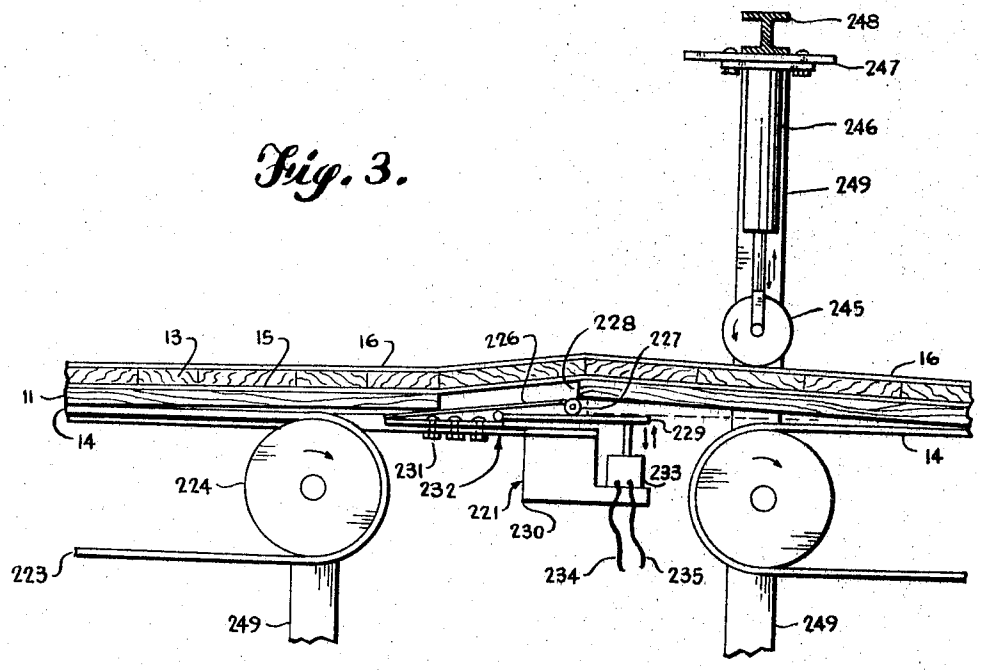
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Fig. 3.



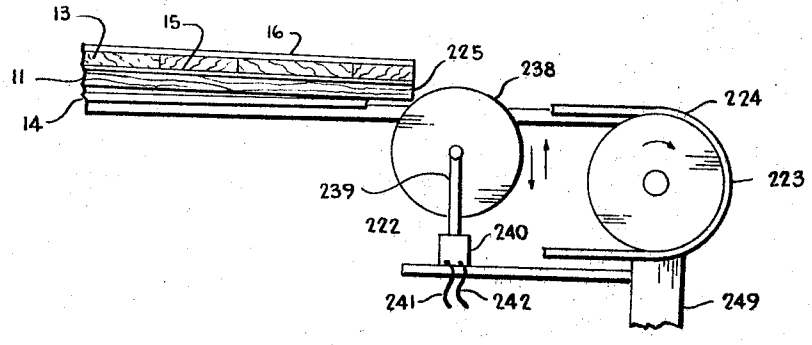


Fig. 4.

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United States Patent Office 3,304,825
Patented Feb. 21, 1967

3,304,825
TRIGGERING CONTROL FOR SEVERING DEVICE

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Filed June 11, 1963, Ser. No. 287,086
4 Claims. (Cl. 83—292)

This invention relates to manufacturing laminated materials wherein laminae are held together by adhesives. More particularly the invention relates to initiating severing of such laminated materials while they are traveling on a continuous flow production line.

The purpose of the invention is to provide automatic sensing controls initiating severing operations to part continuous webs and at times substantially continuous included veneers, previously laid upon separate lamina traveling, slightly spaced but otherwise end to end, along conveying means as illustrated and described in application, Serial No. 219,410, now Patent No. 3,247,042 entitled, "Apparatus and Method for Manufacturing Laminar Materials Joined Together With Wet Adhesive Webs."

Briefly described, the invention comprises a means of directing each separate lamina through an elevation change so subsequently the dropping-trailing edge of the lamina will contact sensing means which in turn will direct energy to a severing means, providing the leading edge of the same lamina has contacted a monitoring means likewise controlling energy directed to the severing means.

An embodiment of this invention is illustrated in the drawings wherein:

FIGURE 1 is an enlarged fragmentary portion of FIGURE 1 of application, Serial No. 219,410, including additions of new sensing apparatus;

FIGURE 2 is an enlarged fragmentary portion of FIGURE 2 of application, Serial No. 219,410, including additions of new sensing apparatus;

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 1, showing sensing controls of the severing means which are actuated by the trailing edge of lamina as the lamina abruptly changes its angularity and elevation; and

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1, illustrating monitoring controls of the severing means which are actuated by the leading edge of the lamina as the lamina passes by the monitoring controls.

As described in application, Serial No. 219,410, lamina are joined together with adhesives carried on a continuous web lamina. Also cross-band core strips are continuously fed into the continuous flow manufacturing apparatus when additional plies are included in the final laminated product. As a result, spaced lamina travel along the conveyor supporting continuous wet webs and core or cross-band laminations. Prior to the stacking of the modules, the continuous wet web and the cross-band core materials are severed by using flying cutters, clippers or the like.

The operation of such a severing means could be undertaken manually but preferably automatic operation is desired. Also rather than rely on a severing timing system not directly related to the flow of lamina which consequently would not conveniently adjust to spacing changes or lamina length variations, the severing timing system of the illustrated embodiment senses passage of the trailing edge of a lamina. Thereafter the severing means is actuated promptly to cut the wet web and the possibly included cross-band cores.

Because the trailing edge sensing means must be reasonably sensitive, it is also capable of unintended occasional operation triggered by imperfections in the bottom surface of passing lamina. For example, protruding knots in plywood face materials have been known to operate the

trailing edge sensing equipment. Therefore, to prevent the unintended operation of the lamina sensing means before observing the passage of trailing lamina edges and consequently the unintended operation of the severing means, a leading edge monitoring sensor is selectively positioned ahead on the conveyor just short of a standard lamina length. Until the monitoring sensor is actuated the severing means will not operate even though triggered by a surface imperfection on the trailing edge of a short lamina.

An embodiment of the severing means triggering system **220** is illustrated in FIGURES 1, 2, 3 and 4, the trailing edge portion sensing means **221** being shown in more detail in FIGURE 3 and the leading edge portion monitoring means **222** being shown in more detail in FIGURE 4. In both FIGURES 3 and 4, for illustrative purposes, the moving laminated materials on the conveyor **14** are indicated as being composed of spaced backs **11**, underlying two spaced wet webs **15** and **16** which are respectively below and above abutting crossband core sections **13**. The conveying means **14** at this location comprising, in part, drive belts **223** traveling around driven pulley wheels **224** to transport laminated materials directly by sensing and monitoring locations. However, at the sensing location the leading edge portion **225** of a back **11** travels also on a ramp **226** resulting in the entire back **11** going over the ramp and the ramp's included roller **227**, which serves as a friction reducer. After the trailing edge portion **228** of the back **11** passes over roller **227**, it drops striking a pivotable contact arm **229** pivoted to a frame member **230**. This frame member **230** and a like one spaced apart are mounted with fasteners **231** to plywood **232** serving as structural framing of conveyor **14**. The pivoting contact arm **229** operates a micro switch **233** which releases electrical energy for passage through leads **234**, **235** to the severing means **47** which is effective unless the monitoring means **222** has not been contacted and actuated by the leading edge portion **225** of the back **11**.

The actuation of the monitoring means **222** is illustrated in FIGURE 4. Leading edge portion **225** contacts a roller-follower **238** as the laminated material carries the respective back **11** to and by the roller-follower **238**. The roller-follower **238** is depressed moving a plunger assembly **239** connected in turn to a micro switch **240**. This switch **240** monitors the sequence interval when electrical energy is passable through leads **241**, **242**, forming a circuit (not shown) inclusive of leads **234**, **235**, associated with the other micro switch **233**. When the roller-follower **238** is depressed upon arrival of leading edge portion **225**, electrical energy will flow to the severing means **47** when the trailing edge portion sensing means **221** is operated.

To insure the trailing edge portion sensing means **221** will operate positively and also to calibrate the timing occurring between its operation and starting the severing means **47**, a pressure wheel **245** is adjustably located from above in rolling contact with a limited width of the passing top wet web **16**. The variance of the distance along the conveyor means **14** between the ramp roller **227** and the pressure wheel **245** and the adjustable pressure, serve as a sensitivity adjustment means. The distance is changed by selectively positioning the mounting of the pressure actuator wheel support **246** on the overhead bracket **247**. The cross beam **248** supports the bracket **247** over the centerline of the conveying means **14**. The cross beam **248** in turn is supported by stanchions **249**.

This illustrated embodiment of the severing means triggering system **220** sensing the terminal end of the passing lamina of correct length before causing operation of the severing means when properly positioned and cali-

brated, is considered the best system to initiate the severing means. Photoelectric sensors, for example, proved to be inapplicable to this problem of detecting the junction where the parting of continuous material extending across and between separate lamina is desired.

I claim:

1. A triggering system for initiating operation of a severing means to separate continuous materials overlaid on separate lamina while all materials are being conveyed during a production run comprising: means to detect the flow of a substantially full size lamina; a means to detect the passing of the trailing edge of said lamina; and means of controlling energy supplied to the severing means which initiates its operation responsive to the sequential operation of the full size lamina detection means and the passing lamina edge detection means.

2. A triggering system for initiating operation of severing means effective in completely separating only continuous materials moving on a conveyor while supported on separate lamina, comprising: a means to cause an elevation change in the lamina during the conveyor run in advance of the severing means location, a means to yieldably receive the trailing edge of the traveling lamina as it leaves the elevation changing means and an energy control means responsive to the yieldable receiving means directing energy to the severing means timely separating only the continuous materials without erroneously severing the lamina.

3. In a triggering system, as defined in claim 2, having in addition to the trailing lamina edge sensing means, a leading lamina edge sensing means serving to monitor the trailing lamina edge sensing means, so the latter will only be effective if a full size lamina is in the severing location.

4. In a triggering system for initiating operation of severing means which separates continuous materials between co-traveling separate lamina during a production run, a lamina detection means, comprising: an elevation changing structure in the path of the traveling lamina, a deflectable receiving structure beyond the elevation changing structure to receive the moving lamina and an energy control device actuated by the deflectable receiving structure causing energy to flow to the severing means.

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