

[54] **METHOD AND DEVICE FOR UNITING WOOD STRIPS TOGETHER**

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[57] **ABSTRACT**

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A method and a device are disclosed for joining wooden strips set at an angle, such as the wooden strips employed for picture frames and the like. The metal fasteners are chevron shaped metal sheet blanks whose respective ends are integral with two parallel running bands. The fasteners have teeth projecting perpendicularly to their common plane, said teeth being intended to be driven into the wood strips. A hydraulic punching press is provided which, once the wood strips set at the desired angle have been positioned on the press bench, drives a punch which severs each chevron-like fastener individually and drives the relevant teeth into the wood strips to be joined.

[30] **Foreign Application Priority Data**

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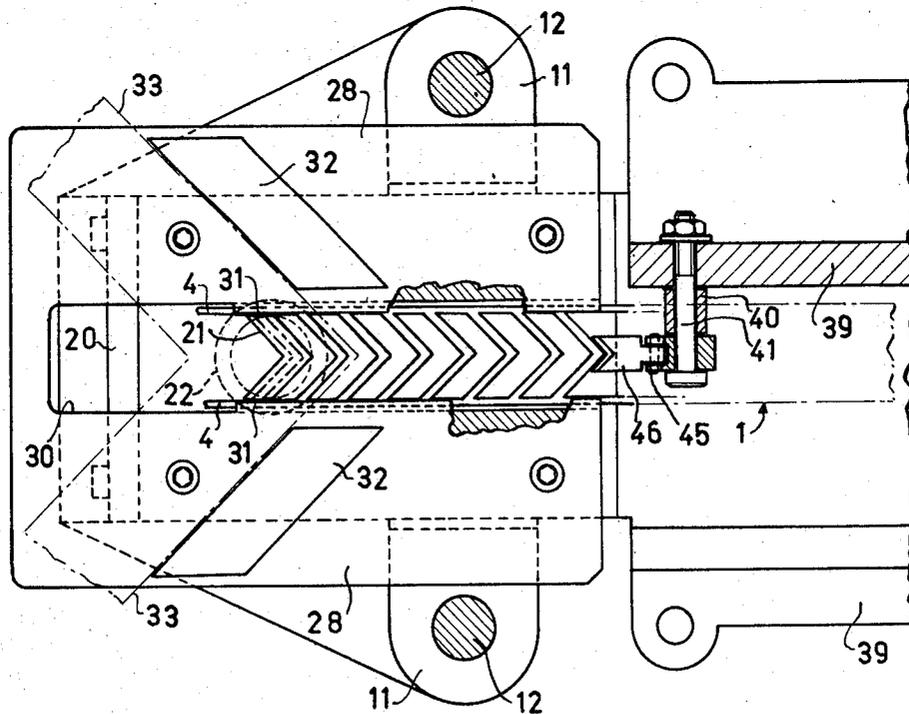
[58] Field of Search.....**29/155 R, 200 A, 200 B, 417, 29/526**

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3 Claims, 7 Drawing Figures



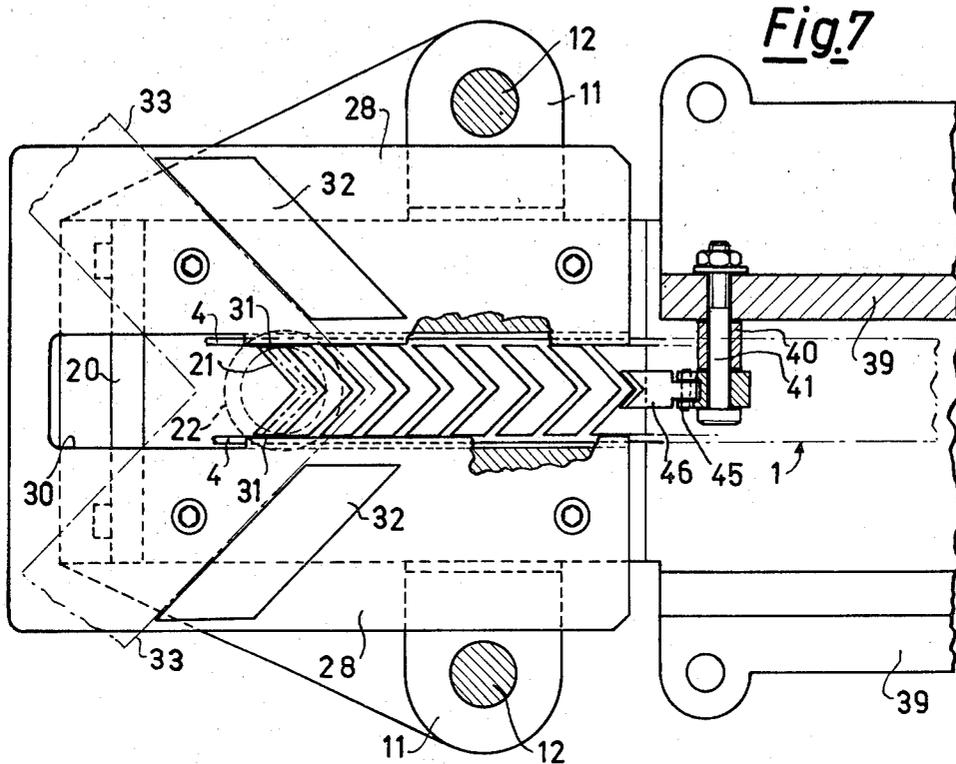


Fig.7

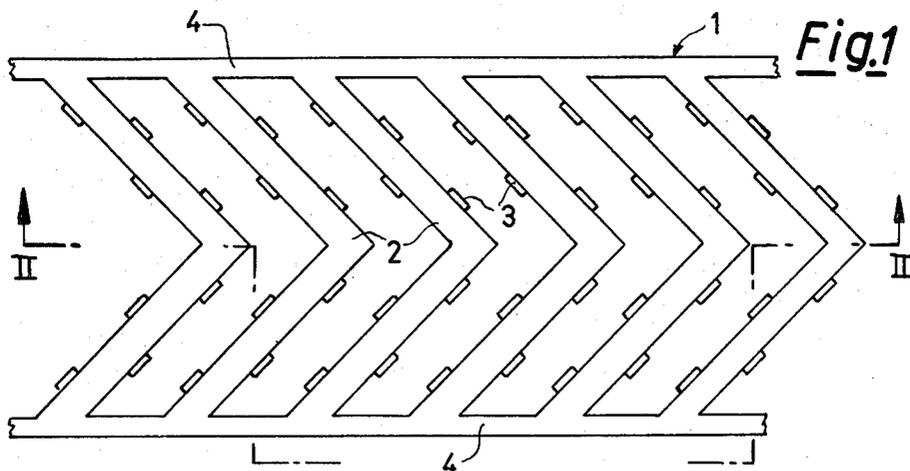


Fig.1

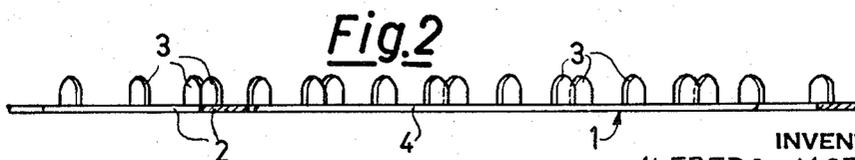
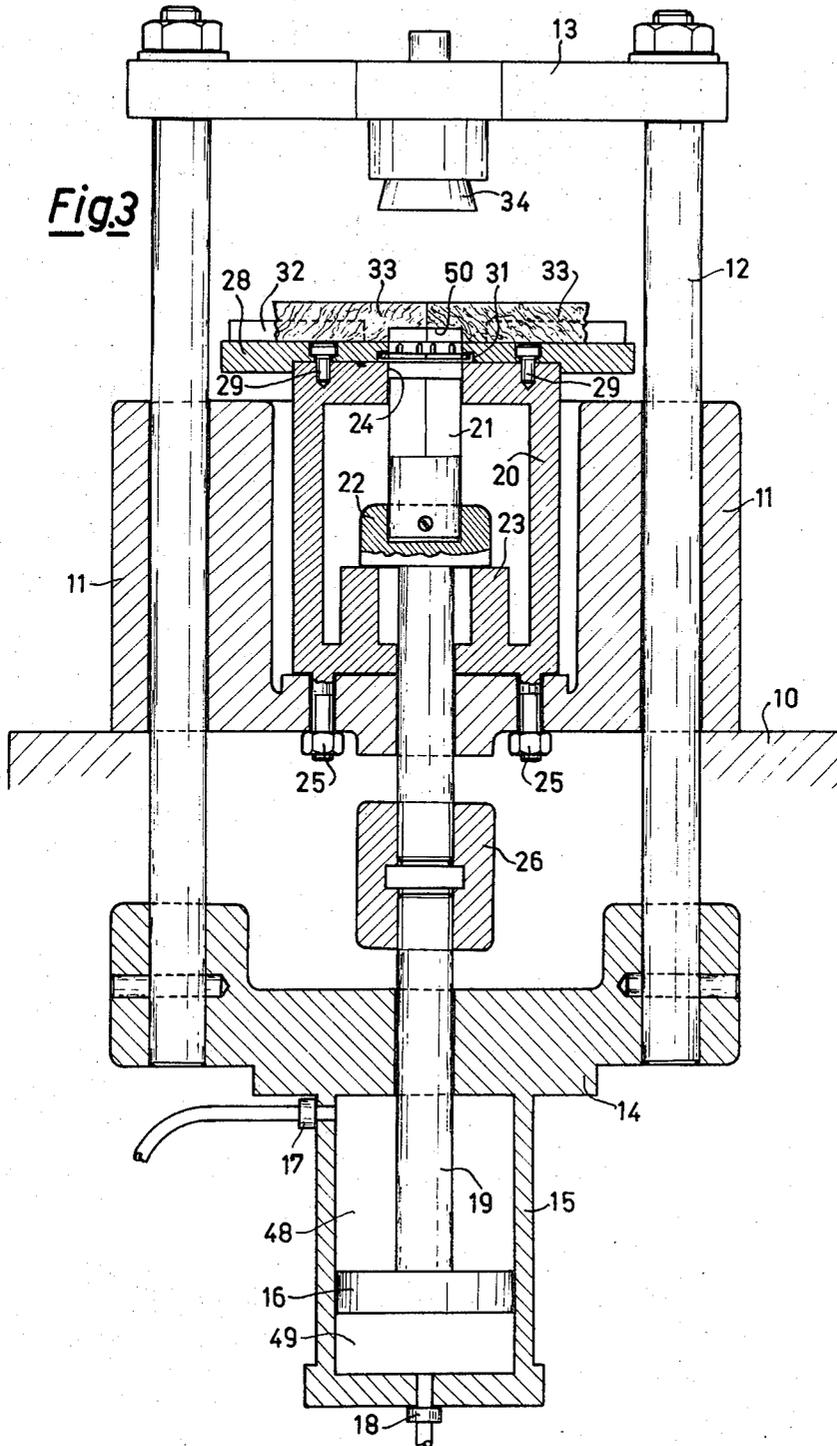
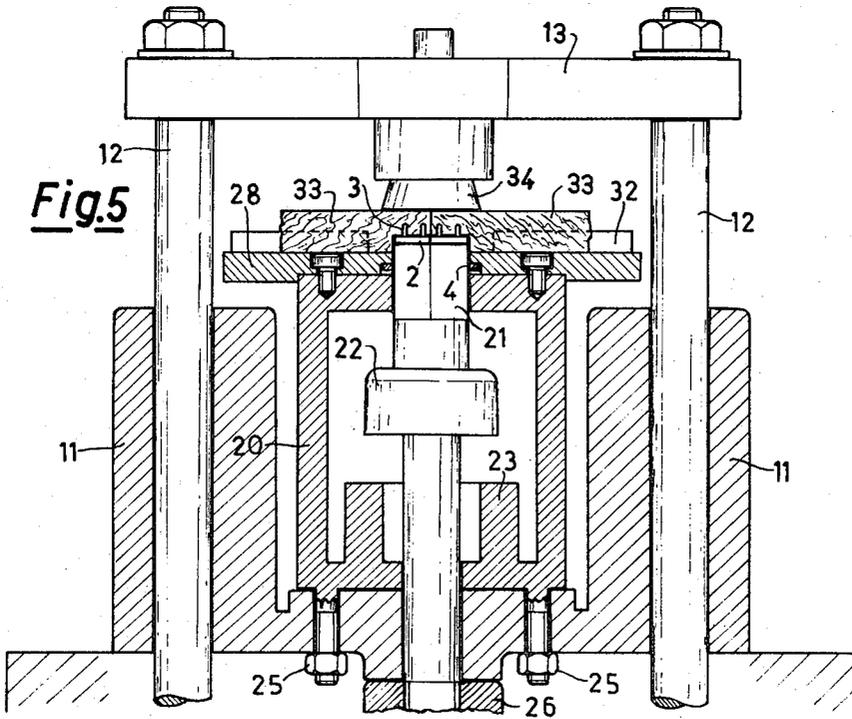
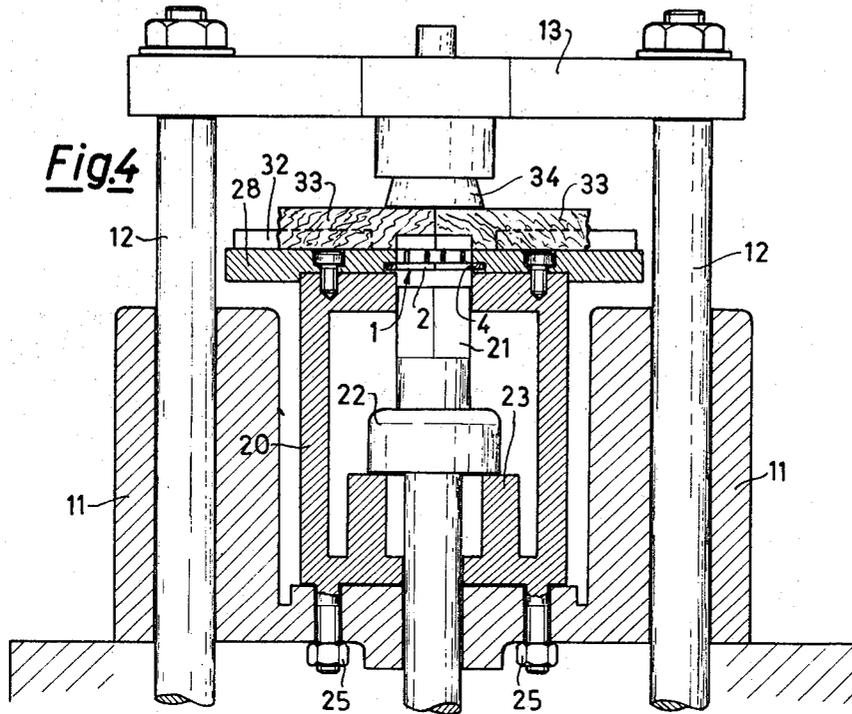


Fig.2

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Fig.3





METHOD AND DEVICE FOR UNITING WOOD STRIPS TOGETHER

This invention relates to a method for uniting wood strips together, more particularly component strips of picture frames.

This invention also relates to a device for carrying out said method.

It is already known, for uniting wood strips together, to employ a plurality of metal fasteners fitted with teeth and sequentially connected to form a loading unit, which is loaded in a device which is adapted to sever said toothed fasteners from each other and simultaneously to drive them into the wood strips to be united together.

These metal fasteners fitted with teeth are usually shaped in the form of a U, that is, they have a central strip from the opposite side of which two toothed wings project perpendicularly, the two toothed wings thus lying on two parallel planes. Consequently, it is easy to understand that a plurality of such fasteners, united so as to form a loading cartridge, can be easily guided within a device having parallel guideways which are complementary with the toothed wings.

In order to be so guided, the fasteners should obviously have all of their surfaces parallel to a single guiding direction.

To unite together wood strips set at an angle in their plane, it is already known to employ individual planar metal members, which also form an angle in their plane and are fitted with teeth which extend perpendicularly thereto.

The orthogonally bent teeth emerging from a shaped planar member in the plane thereof necessarily lie in two different planes which form the same angle with one another.

A thusly shaped member, consequently, cannot be caused to advance on a guideway like the known members aforementioned, since the surfaces of at least a part of the teeth would be at an angle relative to the direction of feed.

For this reason, the metal fasteners as used for uniting coplanar strips set at an angle, such as the strips which make up picture frames, are loaded, one at a time, in the driving-in machine inasmuch as the technical problem of guiding so shaped members has not been solved heretofore, the result being a considerable waste of time as required of the operator.

An object of this invention is to solve such a technical problem, and, to this purpose, it has been envisaged to employ a belt formed by a succession of planar metal members forming an angle in their own plane, equipped with teeth which project orthogonally therefrom, and integral, at both their ends, to two strips of the same metallic material, from which every one of said members is severed by stamping and simultaneously driven into the wood strips to be joined.

In a preferred embodiment, a device for severing from each other said members and to drive them into the wood strips to be joined, comprises guiding means for said strips, the ends of each of said members being affixed to the strips, means for imparting a stepwise forward motion to said belt in a stamping and driving-in station, and means for severing each member from said strips and subsequently driving it into the wood strips to be joined as positioned in said station.

In order that the features of the subject invention may be better understood, a description of same will now be given hereinafter, by way of example only and without limitation, reference being had to the accompanying drawings, wherein:

FIG. 1 is a plan view on an enlarged scale of a belt portion as embodied according to the invention.

FIG. 2 is a cross-sectional view taken along the line II—II of FIG. 1.

FIG. 3 is a vertical cross-sectional view taken along the line III—III of FIG. 6, of a device in the at rest position for uniting together wood strips by employing the toothed member belt as shown in FIGS. 1 and 2.

FIGS. 4 and 5 are detail views of the same device as shown in FIG. 3, to illustrate the two operational stages.

FIG. 6 is a side elevation view showing the automatic mechanism for feeding the belt to the device, and

FIG. 7 is a close up plan view taken along the line VII—VII of FIG. 6.

With reference to FIGS. 1 and 2 of the drawings, the numeral 1 generally indicates the belt as employed according to the invention to unite wooden strips. The belt 1 comprises a succession of planar metal members 2, forming an angle in their plane, and having teeth 3 which project perpendicularly thereto, the members 2 being united to each other at both their ends to two parallel bands 4, which are parallel and made of the same metallic material. The teeth 3, moreover, can have anchoring extensions (not shown) projecting from their lateral surfaces.

Having reference to FIGS. from 2 to 7, a preferred embodiment will be described of a device for automatically joining coplanar wooden strips set at an angle in their plane, by means of the element belt as shown in FIGS. 1 and 2. The device comprises a bedplate 10 to which a guiding member 11 and a boxlike piece 20 are fastened by screws 25.

Uprights 12, as affixed to end plates 13, 14 (top and bottom, respectively), slide upwards and downwards, as will be clarified hereinafter, in said guiding member 11.

Downwardly of the plate 14, there extends a cylinder 15 and piston 16 unit, fed through two ducts 17, 18 for inducting and/or discharging, respectively, a fluid into the relevant chambers 48, 49 as defined by the piston 16 in the cylinder 15.

The piston 16 has, integral therewith, a stem 19 which extends vertically, through the plate 14 and the guiding member 11, into the boxlike piece 20 aforementioned.

The free end of the stem 19 is fitted with a punch 21, which is adapted to emerge from the piece 20, as will be explained in the following, through a complementary bore 24 formed through the top wall of the piece 20. The punch 21 has a shoulder 22, which cooperates with a stop abutment 23 of the piece 20, so as to limit the downward stroke.

The stem 19, for convenience of assembly, is in two pieces, and these are united by a threaded collar 26, which, by cooperating with an abutment 27 of the guiding member 11, is also intended to limit the upward stroke of the punch 21.

A-top the piece 20 is affixed, by screws 29, a supporting plate 28 having a rectangular longitudinal central opening 30 (FIG. 5).

The longitudinal opposite edges of the opening 30 are stepped in their lower half and define with the outer surface of the top wall of the piece 20, guideways 31 for the belt 1.

The plate 28, in addition, has an angular abutment ridge 32 for exactly positioning thereon the wood strips 33 to be joined: these latter, during the operation of the device, are firmly held on the plate 28, as will be explained hereinafter, by a pad 34, the latter being affixed to the top end plate 13.

The belt 1, in the form of coils 35, is loaded on the device as shown in FIG. 6, and its leading end is brought, through the guideways 31, above the bore 24, through which the punch 21 can emerge.

To ensure a correct feeding of the belt 1 in the guideways 31, a stretcher 36 is inserted between the guideways and the coil 35. The stretcher 36 is affixed at one end at 37 to a shoulder 39 of the machine and its opposite end acts upon the belt 1 by urging it in the direction of the arrow. The belt 1 is automatically fed into the device, as will be explained hereinafter, by a lever 40 which is pivoted at an intermediate point 41 to the shoulder 39.

One end of the lever 40 has a cam profile 42 which cooperates with a follower 43 mounted at the free end of an arm 44, the latter jutting from the plate 13.

To the other end of the lever 40 is pivoted at 45 a pawl 46 whose free end acts between the teeth 3 of two consecutive members 2 of the belt 1; 47 is a recoil spring cooperating with the lever 40.

The operation of the device described above is as follows.

Once the belt 1 has been loaded as shown FIG. 6, and the strips 33 to be joined have been positioned on the abutments 32, inasmuch as the fluid pressure in the chamber 48 of the cylinder 15 maintains the device in the position shown in FIG. 1, if the fluid is discharged from the duct 17, the cylinder 15 and the plate 14, the uprights 12 and the plate 13 will slide downward, thus bringing the pad 34 to the position of FIG. 4 against the wood strips 33 to be joined.

If the duct 17 is still connected to the discharge and fluid under pressure is now fed into the chamber 49 through the duct 18, the piston 16 and its stem 19 will slide upward and bring the punch 21 from the position of FIG. 4 to that of FIG. 5. During this stroke, the punch 21 severs by stamping a member 2 from the belt 1 driving the member 2 immediately after into the wooden strips which have been properly grooved at 50. As clearly shown in FIG. 5, the member 2 is severed from the side strips 4 of the belt 1, which remain at their place in the guideways 31 and emerge in front of

them.

With reference to FIG. 6, it will be understood that, when the pad 34 is in the position of FIG. 4, the follower 43 will not be active any longer on the cam profile 42 of the lever 40, so that the latter, urged by the bias of the spring 47, will be rotated in the direction of the arrow F_1 and consequently the pawl 46 will first oscillate upward at 45 as thrust by the teeth 3 of the member 2 placed behind it and then, due to gravity pull or an appropriate spring (not shown) will fall again between the teeth 3 and those of the preceding member 2.

By so doing, and restoring the device to the position of FIGS. 3 and 6, as preset for a new operational cycle, by introducing pressurized fluid into the chamber 48 via the duct 17, the follower 43 will act upon the cam profile 42 of the lever 40, so that the latter will be rotated in the direction of the arrow F_2 with its pawl 46, which, urging the teeth 3 of the member 2 place behind it, will cause the belt 1 to be fed forward through a step which suffices to bring the first member 2 of the belt 1 to such a position as to be severed and driving into the wood strips to be joined, during the following operative cycle. Of course, the device could also be differently embodied without changing anything, at least as far as the scope of the invention is concerned.

What is claimed is:

1. A method for joining wooden strips together, characterized in that it employs a belt formed by a succession of planar metallic members forming an angle in their own plane and having teeth orthogonally projecting therefrom said members being integral at their ends to two strips of the same metallic material, wherefrom each of said members is severed by stamping and subsequently driven into the wooden strips to be joined.

2. A means to be employed in the method according to claim 1, characterized in that it comprises a belt formed by a succession of planar metallic members forming an angle in their own plane and fitted with teeth projecting orthogonally therefrom; said members being integral at their two ends to two strips of the same metallic material.

3. A device for severing from each other said members and for driving them into the wooden strips to be joined, according to claim 1, characterized in that it comprises guiding means for said strips to which the ends of each member are affixed, means for imparting a stepwise forward motion to said belt in a severing and driving-in station, and means for severing each member out of said strips and driving it subsequently into the wooden strips to be joined, as positioned in said station.

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