METHOD FOR MAKING CORNER OR EDGE PLATES FOR CASES, PACKING, CONTAINERS OR OTHER RECEPTACLES AND A PLANT FOR CARRYING THROUGH THE METHOD

Inventors: Hans Elov Nordgren, PL 4322, S-82800, Edshyn; Per Klockarns, PL 2252, S-82200, Alfta, both of Sweden

Filed: Mar. 15, 1972

United States Patent

[54] METHOD FOR MAKING CORNER OR EDGE PLATES FOR CASES, PACKING, CONTAINERS OR OTHER RECEPTACLES AND A PLANT FOR CARRYING THROUGH THE METHOD

[76] Inventors: Hans Elov Nordgren, PL 4322, S-82800, Edshyn; Per Klockarns, PL 2252, S-82200, Alfta, both of Sweden

[22] Filed: Mar. 15, 1972

[21] Appl. No.: 234,836

[30] Foreign Application Priority Data
Mar. 29, 1971 Sweden........................................... 4051/71

[52] U.S. Cl.................. 113/1 R, 113/116 A, 72/326
[51] Int. Cl.................. B21d 49/00
[58] Field of Search...................... 113/1 R, 1 A, 116 A; 29/33 S, 33 Q, 562, 564, 34 R, 6.1, 6.2; 72/324, 325, 405

[56] References Cited
UNITED STATES PATENTS
3,180,294 4/1965 Daalderop .................................. 113/113
2,183,159 12/1939 Chesley................................. 113/1 R
2,301,236 11/1942 Yoder.................................. 83/320
2,051,011 8/1936 Smith.................................. 113/113
2,975,818 3/1961 Rippe.................................. 133/1 R
3,510,933 5/1970 Taylor et al.......................... 113/1 R

FOREIGN PATENTS OR APPLICATIONS
471,160 8/1937 Great Britain.......................... 113/1 R
877,822 9/1961 Great Britain.......................... 113/1 R
78,885 11/1933 Sweden................................ 113/1 R

Primary Examiner—Richard J. Herbst
Attorney, Agent, or Firm—Diller, Brown, Ramik & Wight

ABSTRACT
This disclosure has to do with the forming of fittings for wood containers and the like from continuously fed strip material. Mechanism is provided for performing various stamping and working operations on this strip material in a manner to keep pace with the movement of the strip material and after each work operation is performed on the strip material, the tool performing the work operation is returned to its initial position and subsequent performance of a further work operation.

34 Claims, 14 Drawing Figures
METHOD FOR MAKING CORNER OR EDGE PLATES FOR CASES, PACKING, CONTAINERS OR OTHER RECEPTACLES AND A PLANT FOR CARRYING THROUGH THE METHOD

The present invention is related to a method and a device to make, of a strip or band like material, corner and edge plates for cases, packings, containers or other receptacles.

It is here primarily the question of containers consisting of wood material, e.g., plywood, while the plates and securing tabs thereof consist of a metal.

In the methods hitherto known for making strips of this kind difficulties have been encountered. It has been preferred to feed the strip like material continuously, but in doing so it has been necessary to tolerate inferior results of the work of the tools, since the movement of the strip relative to the stationary tools has involved various damages and an inferior quality. By a step-wise feeding of the strips, enabling e.g., stamping to be performed of a stationary strip, damages to the strip material are certainly avoided, but the production volume per time unit will instead be decreased very seriously.

The present invention the object of which is to solve these problems and attain a perfect stamping, striking or forming action notwithstanding a continuous feed of the strip, is substantially characterized in that the strip or band is fed continuously from the supply in that each of the tools are made to move in the length direction of the strip during a stamping or working operation and to keep pace with the strip at substantially the same speed as that of the strip, and in that the tools after accomplishing their working operation, are returned into their initial position.

With reference to the appended drawings, there follows below a detailed description of an embodiment of a plant according to the invention, quoted as an example.

In the drawings:

FIG. 1 is a vertical general view of the plant;
FIG. 2 a plan view of the plant;
FIG. 3 a partially cut-out perspective view of a stamp comprised in the plant;
FIG. 4 a highly enlarged, partly cross-sectioned perspective view of portion of a stamp in the plant;
FIG. 5 an enlarged perspective view of a forming tool of the plant;
FIG. 6 a partly cut-out perspective view of a program transmitter device in the plant, and
FIG. 7 A–H fragmentary views of strips worked upon in different working stations.

In FIGS. 1–2 a first stamp, punch or die is generally designated 1, a second stamp 2, a third stamp 3, a fourth stamp 4 and a fifth stamp 5. A supply of strip like material is designated 6 while an equipment for giving a program is designated 7. 8 designates a station for impressing stiffening grooves into the strip and 9 a profile former. By 10 is generally designated a forming tool for imparting to the strip bulges of a kind described later. 11 designates a shearing means while 12 designates strips or bands designed to be formed into plates.

FIGS. 7 A–H illustrate the different steps of making a plate of a desired shape out of two initially flat, elongate strips. FIG. 7 A shows how the single strips in a first step are imparted groups of securing tabs 13 disposed at a certain spaces, each group comprising a first number – actually three – of tabs. The groups are in

FIG. 7 A designated 13. This first method step is accomplished at the first stamp 1 shown in FIGS. 1 and 2. At the second stamp 2, the next step is undertaken, consisting in imparting to the strips further groups 13’ of securing tabs (see FIG. 7 B), each of the new groups 13’ comprising a second number of securing tabs, in fact two. By the third stamp 3 still further groups 13” (see FIG. 7 C) are stamped each comprising a third number of securing tabs, in fact only one tab. At the three first stamps 1–3 groups of securing tabs are thus stamped out, forming together a continuous row of tabs in each strip except for portions 14 returning at certain intervals where bending recesses are later to be stamped out.

In FIG. 7 D is illustrated how elongated bores or slots 15 are conveniently stamped out centrally of each of the strips and having the longitudinal direction thereof parallel to the longitudinal direction of the strip. The purpose of these bores is to accommodate a plate to be joined or coupled together with a plate subsequently made of the strip length in question. It may concern a cross plate or a locking plate to be coupled together with the plate in question. The fact that the bores are in this case disposed centrally of the strip is due to the fact that the strip will subsequently have a V-formed cross section profile of a kind having the V-webs of equal size. Hence follows, that the bores 15 will be disposed exactly in the border zone between the webs.

Stamping out the bores 15 is accomplished at the fourth stamp 4, FIGS. 1 and 2.

FIG. 7 E shows that triangular cuts 16 are stamped into the strip to permit bending for example at right angles of a subsequently V-formed plate. In the shown embodiment the cuts 16 are disposed at the same side of the centre of the strip as the securing tabs 13 and the cuts extend from the edge of the strip to the centre of the strip. In such manner the cuts interrupt one V-web whereby the other web will be easy to bend. It is also to observe that the cuts are stamped out exactly at the portions 14 not exhibiting any securing tabs. The stamping out of the cuts 16 is accomplished at the fifth stamp 5 according to FIGS. 1 and 2.

FIG. 7 F shows the strips being formed with stiffening grooves 17 along one edge, in fact the edge disposed oppositely to the securing tabs. Forming the stiffening grooves is carried out at the printing station 8 previously mentioned.

FIG. 7 G illustrates how the strips are imparted with an V-formed or right angled cross section profile, two webs 18 and 19 oriented at an angle to each other being formed. This is made at the profile former 9.

FIG. 7 H shows that bulges 20 are formed on the webs 18 in connection to the elongated bores 15. These bulges are to accommodate other plates related above and which are subsequently to be coupled together with the plate made of the present strip. The bulges have accordingly a height with respect to the remaining web that is at least equal to the thickness of the other plate. The forming of the bulges 20 is carried out at the forming tool 10 which is located following the profile former 9.

As a last step the strip thus formed is sheared by means of the shearing means 11 into predetermined lengths while forming bendable plates ready to be, after bending, applied to a desired container portion by pressing the securing tabs into the walls of the container.
In accordance with the main principle of the invention the strips are fed substantially continuously from the supply and each of the tools are during a stamping or working operation caused to move with the strip at substantially the same speed as that of the strip, and the tools are returned to their initial position after having accomplished their working operation.

FIGS. 1 and 2 also show that the supply 6 consists of a winder 21 accommodating two rolls of strip 12a and 12b. Strips may thus be wound off the rolls which when they are run out are exchanged for new rolls by de-mounting and mounting respectively of the side pieces 22 of the winder. From the winder the strips run into the series of stamps by a deflecting roll 23 disposed on an arm 24. On this arm preferably a photo-cell device 25 may be provided warning when the strip rolls run out and interrupting by a main switch not shown, all working functions of the stamps, the profile former etc to make a joining of strips from new band rolls in the winder possible. The time interval between such joining depends of course upon the strip length of the rolls and if then the strip lengths are taken sufficiently great, e.g., several hundreds of meters, the time interval will be conveniently long.

Since each of the stamps 1-5 and also the shearing means 11 are designed in principle in one and the same manner one stamp solely will be described more particularly in the following. This will be made with reference to FIG. 3, showing that the stamp includes a housing 26 which exhibits at its bottom side two tubular supports 27 movable along a pair of guides 29 mounted on a frame 28. The guides 29 are directed parallel to the longitudinal direction of the strip 12, whence follows that the housing 26 is movable in the longitudinal direction of the strips. The displacement of the housing 26 according to the invention is provided by an, e.g., pneumatically driven piston rod 30 in a cylinder 31 firmly connected to the frame 28. The piston rod 30 is at its outer end projecting from the cylinder connected to the housing 26 by an arm 32 depending from the lower side of the housing. The housing 26, which in FIG. 3 shown in an initial position, is lockable therein by means of a pivotable pawl 33 which locks by engaging a locking bore in a projecting body 34 attached to the housing. The pawl 33 is preferably movable into and out of its locking position by means of a piston or cylinder device 35 actuable in a pneumatic, hydraulic or electrical manner. Opposite to the pawl 33 a protective limit switch 36 serves to interrupt the functions of all stamps and similar if the housing would inadvertently and erroneously move all the way into its leftmost position in FIG. 3.

To the top of housing 26 a vertical hydraulic cylinder 37 is attached, comprising a vertically reciprocatable piston rod 38. Movement of the piston rod 38 downward is caused by supplying hydraulic medium to the cylinder by a first conduit 39 while movement in the opposite direction is caused by supplying medium through a second conduit 40. Both of the conduits 39 and 40 are flexible to permit the displacement of the housing 26 and consist preferably of rubber hoses. At the lower part the piston rod 38 is by means of a joint 41 connected to a pressure plate 42, which is slidable along upright column pieces 43 in a support plate 44 attached to the lower, horizontal portion 45 of the housing. On said support plate 44 a guide element 46 is in turn attached, which, in the case of the stamps 1-3 stamping the securing tabs, has the form of a plate having two edge webs extending over portions of the strips and guiding the strips 12 laterally and further a central web likewise extending over portions of the strips. The plate is attached to uprights which are resiliently displaceable into the support plate 44.

At the lower portion 45 of the housing 26 a bracket 47 is attached, which carries a retainer device or driver generally designated 48. This retainer device includes an abutment body 49 which can chuck the strips 12 between itself and the upper side of the bracket. The body 49 is disposed on the lower side of an arm 51 pivotable about the joint or pivot 50, the outer end of arm 51 being pivotally connected to a piston rod 52 of a hydraulie cylinder 53, which is supported by pivots 54. The pivots 50 and 54 are disposed in stands 55 and 56, respectively, rising from the bracket. The hydraulic cylinder communicates with a hydraulic pump or source by two flexible conduits 57 and 58, one of which is seen in FIG. 3 (cf. FIG. 2). The retainer device 48 described serves to retain the strips during each stamping operation and thereby to inadvertent displacement of the bands.

Further comprised in the stamp is a number of limit switches, two 59, 60 of which are shown in FIG. 3. They control the movements in the piston-cylinder device 37-38 and the retainer device 48.

FIGS. 1 and 2 show hydraulic liquid pumps 61 disposed at each of the stamps 1-5 and also a pump 62 disposed at the shearing means 11. The pumps 61 communicate with the conduits 39 and 40 to the cylinder 37 as well as with the conduits 57 and 58 to the cylinder 53. The pump 62 is common to the shearing means 11 and the forming tool 10. At each of the stamps 1-5 is in addition thereto a pressure air source 63 disposed for the operation of the piston-cylinder device 30-31, and similarly a pressure air source 64 common to the shearing device 11 and the forming tool 10 communicates with the driving means 30-31 of the shearing means and the forming tool respectively. Though the pressure air source 64 is in this manner common to the shearing means and the forming tool, the movements thereof can be controlled independently of each other preferably by electrical means.

FIG. 4 shows an enlarged partial perspective view of the stamp 2. It appears thereby that the guide elements 46 has the form of a plate 65 exhibiting two outer edge portions 66 and 67 extending slightly over the strips and a T-formed central portion 68. The plate 65 is attached to a stand 69 which is depressible into the support plate 44 against the action of springs (see FIG. 3). The stamp members 70 proper consist of pins rising from the support plate 44 or portions thereof and corresponding to bores or passages, not shown in FIG. 4, in the guide plate 65. These stamp members exhibit an upper surface inclined with respect to the horizontal plane, the uppermost portion of which is pointed or sharp while its lower most portion is more or less gently rounded. On the under-side of the press plate 42 dies 71 are disposed having recesses 72 with the same cross section profile as the stamp members 70. Obviously the press plate 42, when moving downward, depresses the guide plate 65 which in turn, owing to the overhanging portions 66, 67, 68, carries along the strips or bands 12 in a downward direction, the stamp members 70 stamping out upwardly directed securing tabs 13 when cutting through the strips and advancing upwardly into the
recesses 72. When the press plate 42 returns to its ini-
tial position the guide plate 65 will also be moved up-
ward into its position shown in FIG. 4 by the fact that 
the uprights 69 are spring actuated. During this action the 
guide plate returns into the merely guiding and strip 
carrying function. The fact that the securing tabs 13 are 
stamped out in an upward direction in the manner de-
scribed above is extremely advantageous in that the 
strips thereby may be simply moved along through the 
other stamps, resting with their plane lower surface on 
the guide or support elements 46 while the tabs go 
clear.

The above features are common to all of the three 
stamps 1, 2 and 3 for stamping securing tabs. The dif-
fferences between these stamps are solely that the first 
stamp 1 has three stamp members 70 for each strip, the 
second stamp 2 two members 70 and the third stamp 
3 one member 70 for each strip.

The fourth and fifth stamps are differently formed. 
The stamp member of these stamps is attached to the 
press plate 42 and thereby movable against fixed dies 
attached to the support plate 44. The fourth stamp 4 
exhibits cutting stamp members having an elongated 
profile corresponding to the form of the bores 15 while 
the stamp members of the fifth stamp 5 are triangular 
or angulated to impart the triangular form of the cuts 
16.

In FIG. 5 a partial perspective view is shown of the 
forming tool 10 and behind the same the shearing 
means 11.

The forming tool 10 includes similar to the retainer 
device 48 previously described a vertically pivotable 
arm 73 which carries on its under-side a press body 74 
having two downwardly directed, inclined press sur-
faces 75 and 76. The press body is movable toward and 
away from a seat 77 exhibiting two angulated channels 
78 and 79. In each of the channels are recesses 80 and 
81 having a moderate depth and being disposed di-
rectly beneath the press body 74. When the press body 
is depressed down onto a V-formed strip 12 disposed 
in the channel and jams one web of the strip against 
the surface of the channel and the recess a bulge 20 will 
be formed in the web. As the stamps 1–5 the forming tool 
10 is horizontally movable, in that the tool is disposed 
on guides and movable by means of a piston-cylinder 

As further appears by FIG. 5 the shearing means 11 
includes edges 82 attached to the press plate 42. The 
edges 82 shear off the strips 12 by a vertical movement 
against a seat 83. Also the shearing means is hori-
zontally movable to keep pace with the strips.

It appears by FIGS. 1 and 2 that the profile former 9 
in this case consists of in each strip six pairs of rollers 
84 disposed on a frame 85. The rollers are driven by 
a system of chains 86 coupled to a motor 87. The rolls 
are disposed in such a manner that the upper roller in 
each pair abuts solely against one web of the strip com-
ing into existence during the rolling, in fact the web or 
half 18 which is free from securing tabs. The lower rol-
lers on the other hand abut against and carry both of 
the webs. As indicated in FIG. 1 a successive rolling is 
accomplished in the conventional manner in that the 
upper rollers are disposed deeper down in the lower 
rollers at the end of the station than at the beginning of 
the station. The pairs of rollers are in this case adapted 
to pull forth or feed forth the strips from the supply 6.

The printing station 8 disposed prior to the rolling 
station 9 includes two rollers or rolls 88 which are pro-
vided with enlargements to print the stiffening grooves 
17 in the strips. The roller 88 may advantageously be 
driven by means of the same chain system 86 as is used 
for driving the profile roller 84.

According to a preferred embodiment the plant de-
scribed is programmed. The essential units for pro-
gramming are illustrated in FIG. 6. The plant includes 
a programmer generally designated 89, which is by 
electric cables 90 connected to a pulse transmitter 91. 
This pulse transmitter 91 is in turn through cables not 
shown in particular in the drawings electrically con-
ected to each of the stamps 1–5, the forming tool 10 
and the shearing means 11. The programmer 89 in-
cludes on one hand an exchangeable cylinder 92 which 
is on its peripheral surface provided with rows of pro-
jections 93 and on the other a box 95 disposed on a 
support 94 and exhibiting a plurality of switches 96 ar-
ranged opposite the rows of projections 93. The projec-
tions 96 are arranged in patterns forming a predeter-
mined program and they are adapted to actuate on ro-
tation of the cylinder the switches 96 and switch the 
same to induce a given working moment. Each row of 
projections and the associated switch serves a tool, e.g. 
a stamp. The cylinder 92 is detachably disposed on a 
rotatable shaft 97 supported in a support 98 except the 
support 94. On the shaft there is an adjustment wheel 
99 operative to drive the shaft. The adjustment wheel 
99 is displaceable along the shaft by means of a retainer 
100 which in turn is movable along guide beams 101 by 
means of the screw 102. The periphery of the wheel 99 
which is preferably rubber coated abuts frictionally 
against a conical drum 103, which communicates 
through a gear connection 104 with a sensing wheel 
105 adapted to abut against the strip 12 and sense the 
feeding speed thereof. Said shaft 93 is as well as the 
guide means 104 adapted in parallel to a generatrix of 
the conical drum to permit a displacement of the wheel 
99 without the same releasing its frictional connection 
with the drum. It is obvious that the program cylinder 
92 is drivable by means of the sensing wheel through 
the gear connection 104, the drum 103, the wheel 99 
and the shaft 97. It is also obvious that the rotational 
speed of the cylinder 92 can at a constant feeding speed 
of the strips be increased by displacing the wheel 99 in 
a direction towards the largest end of the drum 103, in 
the course of which the wheel 99 in consequence of a 
greater peripheral speed of the drum 103 will rotate at 
a greater speed. When a lower rotational speed of the 
cylinder is desired the procedure will be reversed.

The plant described operates in the following man-
ner. The motor 87 driving the rollers 84 may be electric 
and is by way of example controlled by means of a po-
tentiometer at a certain constant driving speed. Then 
the strips will be fed forth by the rollers 84 from the 
supply 6 and past the different working tools in the 
form of stamps, printing rollers, profile rollers, forming 
tools and shearing means. The feed past the forming 
tool 10 and the shearing means 11, which are under-
stood to be disposed following the profile rollers, is po-
sible thanks to the relative rigidity of the strips. It is ac-
cordingly fully sufficient to feed the strips solely by 
means of the profile rollers, though of course also other 
feed members are conceivable. When the strip 12 move, the sensing wheel 105 will rotate at a definite, 
constant speed, said wheel in turn driving the program
cylinder 92 to make it obtain a speed depending on one hand on the feeding speed of the strip and on the other on the adjustment of the wheel 99 relative to the conical drum 103. The projections 93 actuate on rotation of the cylinder the switches 96 which transmit through the pulse transmitter 91 pulses to the different working means 1, 2, 3, 4, 5, 10, 11.

When the stamp in FIG. 3 obtains a starting pulse from the pulse transmitter 91 the pawl 33 will be released, hydraulic liquid applied to the cylinder 37 to make the press plate 42 move downwards, and the abutment body 49 made to jam and firmly retain the strips by pivoting of the arm 51. Simultaneously therewith the piston rod 30 is made to move into the cylinder 31 at substantially the same speed as the feeding speed of the strips, all of the stamp housing 26 keeping pace with the strips at the displacement thereof. Thanks to this concomitant movement no relative movement will occur in the longitudinal direction of the strips between strips and stamp members, and in consequence the stamping work will be as exactly and well accomplished as if the strips and the stamp apparatus both were stationary.

The stamp member having finished a stamp operation and a securing tab, bore or recess having been formed, the press plate, abutment body and stamp housing will return to their respective initial positions, following which the pawl 33 is made to lock. This process is controlled by the system of limit switches. The working cycle is subsequently repeated in dependence of the program of the program cylinder 92.

As the strips pass the different working tools they will be formed into plates suitable for boxes or containers of occuring dimensions. At one, two or all of the stamps 1–3 the securing tabs 13 are formed with a uniform spacing. These stamps are so timed in respect of each other that a most even distribution of the tabs will be obtained. Thus the first stamp 1 may stamp twice, while the second and the third stamp 2 and 3, respectively, stamp one time solely during the same time interval. The possibilities of variation are almost unlimited. At the fourth stamp 4 the elongate bores 15 are stamped out. The spacing between such bores will of course depend on the manner of use of the fitting or plate, i.e., if and how many cross or other fittings or plates are to be interconnected with the plate in question when mounting a container. The work cycle of the stamp and thereby the spacing between the bores is controlled by one of the rows of projections on the program cylinder 92. At the fifth stamp 5 the recesses 16 designed to permit a bending of the plate are stamped out. Also the work cycle of the stamp 5 is controlled by a row of projections on the program cylinder, whereby the spacings between the recesses will be predetermined in dependence of the desired edge length of the plate. When the strips pass the printing station 8 the stiffening grooves 17 are printed. In the profile forming station 9 the strips are imparted with the V-formed cross section profile. In the forming tool 10 the bulges 20 in the strips are formed. Finally the strips are sheared in desired lengths at the shearing means 11. The plates thus made may be ejected from the shearing means down onto a collecting table emptied at any desired time.

The length of the fittings or plates may be varied by selecting the adjustment of the adjustment wheel 99 relative to the conical drum 103. If long plates are desired the wheel will be adjusted in the vicinity of the narrow end of the drum, whereby the program cylinder 92 will obtain a comparably low speed of rotation. Hence follows that comparably few work pulses are transmitted to the shearing means 11 and that a relative great length of the strips running at a constant feeding speed will have time to pass the shearing means prior to the effectuation of the shearing. Inversely, the wheel 99 is to be adjusted in the vicinity of the larger end of the drum if short plates are desired, the shearing means then coming into action at shorter time intervals.

It is understood that the invention is not limited to the embodiment described above and shown in the drawings solely. Thus also other stamp members may be introduced into the plant to form the plates in another manner than that shown in FIG. 7. On the other hand it is also possible to decouple one or a plurality of stamps or other working tools from the plant exemplified, e.g., the fourth stamp 4 besides the forming tool 10, if the plates are not to be connected to other plates. If straight plates without bendings are desired the fifth stamp 5 will be decoupled. It is possible to drive the different working tools otherwise than by pneumatic or hydraulic means, the embodiment shown being however preferred. The profile former 9 does not necessarily require to consist of rollers, but may consist of firm, stable guide members pressing the strips into V-form. Any modifications are possible without departing from the concept.

What we claim is:

1. A plant for making out of a strip like material corner and edge members of the plate and fitting type for cases, packing containers and like receptacles, including a supply for feeding out strip material; stamping means for stamping out securing tabs, openings, recesses or the like; profile forming means to impart to the strip material a generally V-formed cross section profile; and shearing means for shearing off the strip material into plates forming pieces having a predetermined length; means mounting said stamping means, said forming means and said shearing means for separate reciprocation in the direction of movement of the strip material to keep pace with the strip material at substantially the same speed as that of the strip material during each of the stamping, forming and shearing operations and to return into an initial position after having accomplished their operation; said stamping means being disposed in advance of said forming means which in turn are disposed in advance of said shearing means, and that the stamping means for stamping out the securing tabs includes at least one stamp member positioned below the strip material and at least one die positioned above the strip material and the stamp member, said die and said stamping means disposed in a manner to stamp out tabs which will be directed upwardly at all times in order to secure a non-obstructed feeding of the strip material through all stamping means, forming means and shearing means.

2. A plant as claimed in claim 1, characterized in that said stamping means is a fixed stamp member and the die is a vertically movable die.

3. A plant as claimed in claim 1, characterized in that the supply is a winder from which at least one roll of strip material is able to wind off and that a photo-cell is associated with the winder to indicate the end of a strip material roll and make the plant stop when the winder has run out.

4. A plant as claimed in claim 1, characterized by said stamping means including a first stamping mecha-
nism for imparting to the strip material a first number of securing tabs, for example three.

5. A plant as claimed in claim 4, characterized by said stamping means including a second stamping mechanism for imparting to the strip material a second number of securing tabs, for example two.

6. A plant as claimed in claim 5, characterized by said stamping means including a third stamping mechanism for imparting to the strip material a third number of securing tabs, for example one.

7. A plant as claimed in claim 1, characterized by said stamping means including a fourth stamping mechanism for stamping out in the strip material elongated openings for accommodating other plates in the finished plate.

8. A plant as claimed in claim 7, characterized in that there is a forming tool for forming bulges in the strip material in the vicinity of the openings to accommodate other plates and preferably comprising a vertically movable press member for depressing into a bulging depression in a seat.

9. A plant as claimed in claim 8, characterized in that the forming tool is disposed following the profile former seen in the feed direction of the strip material.

10. A plant as claimed in claim 1, characterized by said stamping means including a fifth stamping mechanism for stamping out in the strip material recesses for permitting a bending of a plate made of the strip, said recesses being preferably triangular.

11. A plant as claimed in claim 10, characterized in that the fourth and fifth stamping mechanisms include movable stamp members disposed above fixed dies.

12. A plant as claimed in claim 1, characterized in that there are positioning means connected to the stamping means for retaining the moving strip fixed relative to said stamping means during a stamping operation, said positioning means being movable during the stamping operation at substantially the same speed as the strip material.

13. A plant as claimed in claim 1, characterized in that the stamp member includes an inclined upper surface, the topmost portion of which is generally pointed while its lowermost portion is gently rounded.

14. A plant as claimed in claim 1, characterized in that there is at least one roll provided with enlargements to impress stiffening grooves into the strip material.

15. A plant as claimed in claim 1, characterized in that the profile former includes at least one pair of rollers with one roller of each pair being abutable with one portion solely of the strip material.

16. A plane as claimed in claim 15, characterized in that the rollers are operable to feed the strip material along.

17. A plane as claimed in claim 1, characterized in that the movements of the stamping means, the profile former means and the shearing means are controlled by a pulse transmitter the pulses of which are releasable in a customary manner by an arbitrary programming device.

18. A plant as claimed in claim 17, characterized in that the programming device includes an exchangeable programming cylinder having projections forming a program and a number of switches connected to the pulse transmitter for actuating on by said projections, the program cylinder being rotatable in dependence of the feeding speed of the strip material.

19. A plant as claimed in claim 18, characterized in that the program cylinder is rotatable at a variable number of revolutions to yield plates having lengths varying in dependence of the number of revolutions.

20. A plant as claimed in claim 19, characterized in that the program cylinder is connected to a wheel sensing the feeding speed of the strip material through a transmission device having a variable gear ratio.

21. A plant as claimed in claim 20, characterized in that the transmission device includes a conical drum connected to the sensing wheel besides a wheel abutting on the drum, driven by the drum and provided on a shaft parallel to a generatrix of the drum, said shaft being adapted to drive the program cylinder, said wheel being adjustable along the shaft.

22. A plant for forming strip material into a plurality of individual formed members, said plant comprising strip supply means, at least one forming mechanism of the stamping and forming type, shearing mechanism and strip feed means for continuously feeding strip material through said forming and shearing mechanisms, mounting means for mounting at least said forming mechanism for controlled reciprocatory movement longitudinally of the direction of strip feed, and forming mechanism feed means for feeding said forming mechanism, said forming mechanism feed means including fluid motor means operable to advance said forming mechanism at substantially the same speed as the speed imparted to a strip by said strip feed means, and latch means carried by said forming mechanism for latching said forming mechanism temporarily to a strip for movement therewith.

23. The plant of claim 22 wherein strip driven programmer means are provided for the timed actuation of said fluid motor means, said latch means and said forming mechanism.

24. The plant of claim 22 together with lock means for locking said forming mechanism in a fixed position.

25. The plant of claim 24 wherein strip driven programmer means are provided for the timed actuation of said fluid motor means, said latch means and said forming mechanism, and for unlocking said lock means.

26. A method of forming corner and edge members of the plate and fitting type for cases, packing containers and like receptacles from strip material, said method comprising the steps of continuously feeding said strip material, forming in sequence a plurality of operating steps on said strip by separate tool means while separately moving a plural certain of the tool means at the same rate as the strip material; said operating steps including in sequence at least one stamping step wherein tabs are struck from the strip material, a forming step and a shearing step, and said forming step being performed in an upwardly striking operation to effect an upward projection of the tabs thereby facilitating the subsequent feeding of the strip material through the following tool means.

27. The method of claim 26 wherein each of said certain tool means is latched to the strip material for movement therewith during the performing of the respective operating step.

28. The method of claim 27 wherein each of said certain tool means has a normal position and is locked therein between the performing of the respective operating step thereby.

29. The method of claim 28 wherein the performing of each operating step and the moving, latching and
locking of each of said certain tool means is effected by remote programming means actuated by the moving strip.

30. The method of claim 27 wherein the performing of each operating step, and the moving and latching of each of said certain tool means is effected by remote programming means actuated by the moving strip.

31. The method of claim 26 wherein the performing of each operating step, and the moving of each of said certain tool means is effected by remote programming means actuated by the moving strip.

32. The method of claim 31 wherein the programming is effected at a point located intermediate the stamping step and the shearing step.

33. The method of claim 31 wherein the programming is effected at a point located intermediate the stamping step and the forming step.

34. The method of claim 26 wherein the forming step is a continuous rolling step and the continuous feeding of the strip material is effected thereby.

* * * * *