

This invention relates to a device for cutting stacked sheet material, corresponding to the features contained in the precharacterising clause of claim 1.

DE 36 13 316 C1 discloses a device of this type, which is used as a second cutting device of a cutting system in which a first cutting device is provided for the production of block strips by means of parallel longitudinal cuts, whilst the block strips are cut in the transverse direction by the second cutting device so that individual blocks are produced. Efficient manufacturing results from the use of two cutting devices which each have one function, namely on the one hand longitudinal cutting to produce the block strips and on the other hand the transverse cutting of these block strips. A disadvantage of this known system is that two cutting devices are necessary for cutting the block strips, which results in high production costs.

The object of the present invention is to further develop a device of the above-mentioned type so that both the functions comprising the longitudinal and transverse cutting of the block strips can be carried out by means of the device, i.e. with a single cutting device, at minimum labour cost, and the cut blocks can easily be fed to the further processing station. The object is also to create a device which also enables the usual cutting operations to be carried out, namely main cuts, edge cuts and intermediate cuts.

This object is achieved according to the invention by means of the features of claim 1. In this connection, the term 'field of action' is not necessarily to be understood as a definite position of the first guide plate; rather, a plurality of positions of this guide plate in relation to the first field region of the output field is conceivable.

The desired different functions can be accomplished by means of the device due to the construction of the output field with the first and the second field region according to the invention, and due to the guide plate disposed below the output field. Thus, when the second field region is lowered, in which position it forms a plane with the first field region and the field of action and with the input field, the device operates in accordance with the device

described in European Patent 0 056 874. The first and the second field regions form a unit which can move in and opposite to the direction of advance of the material to be cut, with the possibility of creating a gap between this unit and the field of action for disposing of the swarf produced during an edge cut or intermediate cut. When the second guide plate is moved into its operating position after opening the gap, this guide plate pushes the cut product, which projects above the first field region due to the necessarily set back position of the cutting strip and of the cutting knife, completely on to the output field, so that it cannot be pinched when the gap closes again. In addition to this, the second guide plate ensures that the swarf is definitely disposed of through the gap and is not thrown on to the output field. The cut product can be freely manipulated on the output field; in addition, the second guide plate situated in the operating position enables the product to be set upright on the output field. In contrast to this, when the second field region is raised and the second guide plate is in the operating position the device fulfils the function of the second cutting device of the system described in DE 36 13 316 C1. In this connection it is essential that the first guide plate is now brought to its operating height, at which it is situated above the plane of the first field region, and in particular locks underneath with the plane of the first field region and consequently a product situated on the first field region can be manipulated by the first guide plate. When the first guide plate is in use, a transverse channel is formed by this and by the second guide plate, through which individual blocks of a block strip, for example, can be fed to the further processing station by means of the movable ejector for the product or products. The width of the transverse channel can be varied in accordance with the width of the product by means of a corresponding adjusting movement of the first guide plate perpendicular to the cutting plane. Independently of this, when the second field region is raised there is of course the possibility, as before, of making edge and intermediate cuts after cutting the actual product, the waste again being disposed of through the gap formed between the first field region and the field of action and the second guide plate fulfilling the functions described above.

The first guide plate may be mounted in various ways, for example on the underside of the second field region or also on the upper side of a bearing part which is disposed parallel to the second field region and below the latter, the first guide plate being disposed between the bearing part and the second field region. The second field region and the bearing part are

advantageously attached to each other, particularly by lateral stays, so that they can be raised and lowered with each other. So that different widths of the transverse channel can be formed, the second guide plate should be disposed, independently of its mounting, so that it can be moved in and opposite to the direction of advance of the material to be cut. Mounting the first guide plate in the bearing part for the second field region is seen as a preferred embodiment, since this guide plate can be mounted and moved most easily in this case. So that products of different widths can be processed, the first guide plate should also be movable within the region of the first field region if possible, wherein a transverse channel width can be obtained which only extends within the first field region or which extends beyond the first field region. For the latter size of transverse channel width it may be advantageous if the bearing part forms a third field region of the output field, which is disposed parallel to the second field region and can be raised into the plane of the first field region. When the second field region is raised, products of large width rest not only on the first field region, but also on the third field region of the output field. In this form of construction it must be ensured that the clear distance between the second field region, in definitive terms the underside of the component associated with this field region, and the bearing part or the third field region of the output field is greater than the maximum thickness of the cut material. For dimensioning of this type, the maximum width of the transverse channel is defined by the position of the first guide plate in its end position when it has moved away from the first field region.

The device according to the invention is advantageously constructed so that a first table part is mounted in a base frame so that it can travel horizontally in and opposite to the direction of advance of the material to be cut, wherein this table part accommodates the first field region of the output field, and a second table part, which accommodates the bearing part and the second field region of the output field, which are disposed parallel to one another, is mounted so that it can be raised and lowered in the first table part. The two table parts are advantageously moved via pneumatic or hydraulic means of force. The second table part is advantageously mounted in vertical guides in the first table part, and the lifting elements for raising and lowering the second table part act on a base for the second field region which can be detached from the latter, and also on the first table part. When the device according to the invention is used over a long period of time solely for cutting identical products which

are fed to the further processing station by means of the ejector, the facility exists of detaching the second field region from the second table part. This results in the cutting region and the region of the first guide plate being clearly visible from the operator's side, and the cutting cycles can thus be monitored.

Particular forms of construction of the device relate to the arrangement and mobility of the two guide plates and in particular to the form of the second guide plate. Since the first guide plate serves the purpose of forming a transverse channel of appropriate width depending on the width of the cut product, it is necessary that this guide plate is disposed so that it can travel in and opposite to the direction of advance of the material to be cut. In addition, this guide plate should be able to travel between an end position associated with the first field region and an end position associated with the bearing part, and in its operating position should be situated substantially perpendicular to the table area. Moreover, the first guide plate is advantageously mounted so that it can swing between two operating positions, wherein in a first position it is inclined substantially corresponding to the bevel and in a second position is substantially perpendicular to the table area. The same applies to the second guide plate, which should also be substantially perpendicular to the table area in its operating position. Furthermore, it is considered advisable if in its rest position the second guide plate is disposed below the first field region of the output field and can be brought through the gap into its operating position, in which it should be seated against the rear edge of the first field region over the entire length of the interface between the field of action and the first field region of the output field. The form of construction and arrangement of the second guide plate described above enables the swarf produced from edge cuts or intermediate cuts to be effectively removed through the gap. Apart from this, the fixed boundary of the transverse channel on one side of the channel is formed by the second guide plate in its operating position. So that the products can be pushed over on to the first field region of the field of action without pinching the lower layers of sheets in both operating positions of the devices, i.e. with the second field region lowered or the third bearing part raised, a movable support element should be provided, mounted in front of the second guide plate, which supports the material which was the last to be cut and which projects beyond the rear edge of the first field region, at least at the level of the cut material contact surface of this field region, wherein the support element is moved back into the plane of the guide

plate when the operating position of the second guide plate is reached. In detail, the second guide plate may be provided with at least one support element, wherein the latter has an upper free end and is swung from a first into a second end position on the final movement of the guide plate to reach its operating position, in such a way that in the first end position, where it is swung out from the guide plate contact surface in the direction of the first field region, the free end of the support element comes to lie below the plane formed by the cut material contact surface of this field region, and in the second end position, where it is swung into the guide plate, the free end of the support element comes to lie at least in the plane of the cut material contact surface of the field region. In addition, the second guide plate may accommodate, on its face which faces the material to be cut, a feed guide plate which can be placed on this face of the material to be cut. This feed guide plate makes it possible to vertically align the face of the stacked sheet material resting on the field of action which faces away from the feeder device. It should be possible to place the feed guide plate on the material to be cut, at least in the region of the upper sheets of the latter. It has been shown in practice that after pressing the material, which is necessary for a perfect cutting operation, the upper layers of sheets in particular are pulled away from the feeder device. The cause of this is usually that when the material to be cut is subjected to considerable pressure, air inclusions are expelled from between the individual sheets, leading to a reduction in the height of the stack to be cut in the region of the crosshead of the press and consequently, when the crosshead of the press is raised, to the upper layers of sheets being moved to an undesirable extent into the region of the cutting knife with the risk of subsequent cutting errors.

Other features of the invention are illustrated in the description of the Figures and in the subsidiary claims. In this respect it should be remarked that all the individual features and all combinations of individual features are essential to the invention.

The invention is schematically illustrated in the Figures with reference to two embodiments, without being restricted to these. The Figures are as follows:

Figure 1 is a side view of a first embodiment of the device according to the invention, in which the output field has a first field region, a second field region

disposed in front of the first field region, and a third field region disposed below the second field region, with the first and second field regions forming a plane and with the gap closed before an edge cut;

Figure 2 is a side view of the device illustrated in Figure 1 with the gap open after the edge cut;

Figure 3 is a side view of the device illustrated in Figure 1 before the main cut;

Figure 4 is a side view of the device illustrated in Figure 1 after several main cuts, with the gap open and the second guide plate extended;

Figure 5 is a view of the device along the arrow A in Figure 2;

Figure 6 is a view of the device along arrow B in Figure 2;

Figure 7 is a side view of the device shown in Figure 1, with the first and third field region of the output field forming a plane, and with the gap closed;

Figure 8 is a side view of the device shown in Figure 7 with the gap open and with the first and second guide plates in the operating position;

Figure 9 is a detailed view of the second guide plate, illustrated before the partial stack is pushed across on to the first field region of the output field;

Figure 10 is a detailed view as shown in Figure 9, after the pushing transfer operation, with the second guide plate having moved in the direction of the field of action;

Figure 11 is a side view of the device according to a second embodiment, in which the output field has a first field region, a second field region situated in front of the first field region, and a bearing part for receiving the first guide plate and

situated below the second field region, with the first and second field regions of the output field forming a plane and with the gap closed after the main cut;

Figure 12 is a side view of the device shown in Figure 11 after the main cut, with the gap open and the second guide plate extended after the subsequent intermediate cut;

Figure 13 is a side view of the device shown in Figure 11 with the bearing part raised and thus with the first guide plate raised after a main cut, with the gap open and with the second guide plate situated in the operating position, and with the first guide plate situated in a first, inclined operating position; and

Figure 14 is a side view of the device shown in Figure 13 with the first guide plate having moved into the second, vertical operating position and with the ejector lowered behind the products.

Figures 1, 5, and 6 illustrate the basic structure of the cutting device, which forms a structural unit and which is constructed in the form of a face cutting machine. A field of action 3 is formed on the front region of the table area 2 of a fixed base frame 1, and an input field 4 is formed in the rear region. The input field serves to receive the material 5 to be cut, comprising a stack of sheets consisting of individual sheet layers, for example. The material 5 to be cut can be displaced in the direction of advance indicated by the arrow C by means of a forward feed device 6 constructed as a barrel. The material 5 to be cut is vertically aligned on one side against a lateral stop 7. A vertically movable crosshead 9 of a press, and a cutting knife 10, which is likewise vertically movable, are disposed above the field of action 3 in a frame part 8 extending above the table area 2 and attached to the base frame 1. The cutting knife cooperates with a cutting strip 11 which is inset in the table area 2 of the base frame 1. For reasons of static loading, the cutting strip is slightly set back in relation to the front edge 12 of the table area 2. The cutting plane of the cutting knife 10 is denoted by reference numeral 13.

Two supports 14, which are disposed spaced apart from and parallel to each other and which also form part of the base frame, are attached to the base frame 1. The supports 14 have horizontal guide rails 15 corresponding to the horizontal arrangement of the table area 2. A table part 16 is mounted on these guide rails so that it can travel in and opposite to the direction of advance C. A pneumatic cylinder 17 is associated with each support 14 for this purpose, the cylinder housing 18 of each pneumatic cylinder being attached to the underside of the table part 16 and the piston rod 19 of each cylinder being attached to the respective support 14.

Figure 4 [sic] also shows that in its rear region, i.e. in the region facing the base frame 1, the table part has four upwardly aligned support stays 20 attached to the table part, with a horizontal table plate 21 rigidly attached to the upper ends of the support stays. The table plate extends over the same width of the device as does the table area 2. The table area of the table plate 21 is designated below as the first field region 22 of an output field for the cut material. It forms a plane with the table area 2 of the input field 4 and of the field of action 3. The table plate 21 is attached to the support stays 20 in the region of its front end 23. When the piston rods 19 of the pneumatic cylinders 17 are retracted in order to move the table part 16 horizontally, the rear end 24 of the table plate 21 is seated against the front edge 12 of the table area 2 of the base frame 1, whilst when the piston rods 19 are extended the table plate 21 is moved horizontally away from the base frame 1 and a gap 25 is thus formed between the base frame 1 and the table plate 21.

In the front region of the table part 16, which is bent upwards at right angles, there are two pneumatic cylinders 26 on each support face disposed one behind the other as seen in the direction of advance C. The cylinder housing 27 of each cylinder is attached fixed to the table part 16, and the vertically movable piston rod 28 is attached to a table plate 29. The table plate 29 has a width corresponding to that of the table plate 21 and is likewise of rectangular construction, but is provided in its front region with a V-shaped indent 31 symmetrical to its central longitudinal axis 30. The four pneumatic cylinders 26 act in pairs on the underside of the table plate 29 in the outer region of the indent 31. When the piston rods 28 are retracted the table area of the table plate 29, which is designated below as the second field region 32 of the output field, forms a plane with the first field region 22 of the

output field. The rear end 33 of the table plate 29 is disposed in the immediate vicinity of, i.e. at the least possible distance from, the front end 23 of the table plate 21.

A connection plate 34 is attached to the underside of each of the external faces of the table plate 29. The two connection plates accommodate a further table plate 35 between them in the region of their lower ends. The width of the table plate 35 corresponds to the width of the table plate 29. However, the table plate 35 is made shorter than the table plate 29, and does not have the region comprising the indent 31. The vertical distance between the table plates 29 and 35 is greater than the maximum height of the material 5 to be cut. When the piston rods 28 of the pneumatic cylinders 26 are in their extended positions, the table plate 35 is raised to such an extent that its table area, which is designated below as the third field region 36 of the output field, forms a plane with the first field region 22 of the output field. In this position the rear end 37 of the table plate 35 is situated adjacent to the front end 23 of the first field region 22 of the output field.

In the region of each of its external faces the table plate 35 accommodates toothed racks 38 disposed parallel to each other and travelling in or opposite to the direction of advance C, which can be synchronously driven by a common drive 40, which is also mounted in the table plate 35 and which comprises gearwheels, which are not shown. The toothed racks 38 are positioned parallel to and at a minimal distance from the table plate 35. At each of their respective free rear ends the toothed racks receive a first guide plate 41 in the region of its lower edge so that it can swivel. The piston rod 44 of a pneumatic cylinder 43 associated with each toothed rack 38 acts on the first guide plate 41 at a distance from the swivelling axis 42 of the first guide plate 41, so that the latter can move from a first position with the piston rods 44 extended in which it is oriented perpendicular to the table plate 35 into a position with the piston rods 44 retracted in which it is inclined at an acute angle to the direction of advance C. The cylinder housings 45 of the pneumatic cylinders 43 are mounted, in a manner which is not shown, so that they are moved together with the advance spindles 38. By means of the toothed racks 38 the first guide plate 41 can be moved in the direction of advance C as far as the two bearings 39 of the toothed racks 38 which are adjacent to it, and can be moved opposite to the direction of advance C beyond the rear end

of the table plate 35. By this means the largest strip formats, which overlap both the first field region and also part of the third field region, can be processed.

A vertically acting pneumatic cylinder 46 is attached to each of the two table parts 16 adjacent to the base frame 1. The piston rods 47 of the pneumatic cylinders 46 accommodate a guide plate 48 which is also in the form of a plate and which is designated below as the second guide plate. The vertically movable and vertically oriented guide plate 48 is positioned so that it can travel past the rear end 24 of the table plate 21 at a slight distance from the latter when the gap 25 is open to its maximum extent. When the guide plate 48 is in its raised position, its upper edge 49 is situated at least slightly above the uppermost sheet layer of the material 5 to be cut. The guide plate 48 has a length which corresponds to the width of the table plate 21.

Finally, an additional vertically acting pneumatic cylinder 50 is mounted in the frame part 8. Its piston rod 51 is provided with a mounting stay 52 extending in the direction of advance C, to the underside of which an ejector 53 is attached. The ejector is positioned so that it is situated above the table plate 21 when the gap 25 is open to its maximum extent. When the piston rod 51 is retracted the lower edge of the ejector 53 is at a level which is higher than the level of the uppermost sheet layer of the material 5 to be cut; when the piston rod 51 is extended the ejector 53 rests on the table plate 21. The ejector 53 itself is constructed as a rod-like component, the rod length of which is greater than the maximum thickness of the material 5 to be cut. The cylinder housing 54 of the pneumatic cylinder 50 *[sic]* is mounted in a horizontal guide 56 on the frame part 8 by means of a bearing element 55, and can be moved perpendicularly to the direction of advance via a horizontally-acting pneumatic cylinder, which is not shown. The frame part 8 is provided at the top on both sides with support rods 57 pointing forwards and with support rods 58 pointing downwards and engaging with the front ends of the support rods 57, which support rods 58 in turn accommodate light box arrangements 59 in their lower regions. The output field region associated with this light box arrangement 59 thus constitutes the operator side of the face cutting machine. The operator end is located in the region of the indent 31.

The mode of operation of the device according to the invention is described below with reference to the Figures.

When the table plate is lowered, in which position the input field 4, the field of action 3, the first field region 22 of the output field and the second field region 32 of the output field form a plane, the device operates in accordance with the device described in European Patent 0 056 874. Edge cuts, intermediate cuts and main cuts can thus be made with the device in the known manner. Figure 1 shows the device before an edge cut. The material 5 to be cut is advanced beyond the cutting plane 16, by the thickness of the edge cut to be made, by means of the forward feed device 6. Before the edge cut is made, the table part 16 is moved away from the base frame 1 under the action of the two pneumatic cylinders 17. The gap 25 is thus formed between the rear end 24 of the table plate 21 and the front edge 12 of the table area 2. The second guide plate 48 is then moved into its extended position under the action of the two pneumatic cylinders 46, so that the cut material which is severed during the subsequent edge cut, which may be brittle, cannot be thrown on to the table plates 21 and 29 but instead can be discharged downwards through the gap 25, by being fed on to a conveyor belt there, for example. The second guide plate 48 is provided on its side facing the material 5 to be cut with a feed guide plate 60, which is mounted on the second guide plate 48 by means of two scissor-type flat stays 61 disposed at a distance from each other. A pneumatic cylinder 62 is associated with each scissor-type flat stay 61 for opening and closing the latter, so that by this means the feed guide plate 60 can be moved towards the front face 63 of the material 5 to be cut. It is thus possible to cancel out displacements, particularly displacements of the upper sheet layers which occur after releasing the crosshead 9 of the press following the cutting operation, by bringing these sheet layers into contact with the forward feed device 6 again (see Figures 9 and 10). After trimming all the edges of the material to be cut, which hitherto has existed as a block, the actual main cuts are made in which the products are obtained, and the intermediate cut is made between each two main cuts. Figure 3 illustrates the position of the material 5 to be cut before a main cut is made. The material 5 to be cut has been moved in the direction of advance C by means of the forward feed device 6 until the main cut position is reached. After the block has been cut through, a product exists, namely cut material 5', which is intrinsically skew in the form of a parallelogram due to the wedge-shaped form of the cutting knife. This cut material also

still rests slightly on the table area 2, due to the arrangement of the cutting strip 11 in the table area 2. When the gap 25 is opened for the purpose of an intermediate cut, the cut material 5' thus slightly overhangs the rear end 24 of the table plate 21, with the risk of this region of the cut material 5' being pinched when the gap 25 closes again. Figure 9 makes it clear that after the maximum extent of opening of the gap 25 has been reached, the second guide plate 48, which has been moved into its raised position, engages beneath the overhanging region of the material 5' to be cut by means of a plate-like support element 64. The support element is swivel-mounted on the second guide plate 48 below the table plate 21, and can be swung into a recess 66 in the second guide plate 48 against the force of a plurality of springs 65, of which only one is visible, so that the support element 64 forms a plane with the second guide plate 48. If the table plate 21 is moved, starting from the supporting position of the support element 64 shown in Figure 9, in the direction of the second guide plate 48 by the action of the pneumatic cylinders 17 on the table part 16, this results in the cut material 5' being pushed completely across on to the table plate 21. Figure 4 illustrates the situation following a second main cut: the second guide plate 48 is extended, the product 5' which was the last to be cut has been pushed completely on to the table plate 21 by means of a slight travel of the table plate 21 in the sense of a closure movement, and has thus pushed the product 5' which was cut first further on to the table plate 29. The feed guide plate 60 then travels towards the front face of the material 5 to be cut. The position of the second guide plate 48 illustrated in Figure 10 indicates that the second guide plate 48 may of course be provided with an additional horizontal travel capacity, particularly in the direction of the material 5 to be cut. The material 5 to be cut is cut through in a sequence comprising: main cut, intermediate cut, main cut, intermediate cut, etc., until the material 5 to be cut is completely cut up.

If the cut material 5', which exists in the form of block strips, is to be cut up further into individual blocks, this can in principle be carried out by vertically aligning the cut material 5' manually on the second guide plate 48 by means of an angle tool to form it into a rectangular block, and then turning it by 90° and feeding it again as material 5 to be cut to the field of action 3. The table plate 29 and thus also the table plate 35 are then raised under the action of the pneumatic cylinders 26 into a position in which the table plate 35 forms a plane with the table plate 21. In this position the course of the operation relating to the

cutting of the block strips into individual blocks corresponds to that described in DE 36 13 316 C1: the individual block strips are first advanced by the forward feed device 6 corresponding to the thickness required for the first main cut. The first guide plate 41 is then moved in its position inclined from the vertical towards the lower region of the material 5 to be cut by means of the advance spindles 38. Figure 7 illustrates the situation after the cut, in which the individual blocks are again skew in the form of a parallelogram and are supported by the first guide plate 41. The table part 16 and thus the table plates 21 and 35 are moved together away from the base frame 1 under the action of the pneumatic cylinders 17, with the formation of the gap 25. The second guide plate 48 is then extended and the first guide plate 41 is moved into its vertical position under the action of the pneumatic cylinders 43, by means of which the individual blocks are set upright again. A transverse channel 47 is formed at this point between the first guide plate 41 and the second guide plate 48, through which the individual blocks can be pushed out towards a further processing station after the ejector 53 has been lowered. An intermediate cut can be made during this ejection operation; the next main cut is then made after closing the gap 25.

Figures 11 to 14 illustrate a second embodiment of the invention. The parts illustrated correspond to those according to the first embodiment illustrated in Figures 1 to 10, and are denoted below by the same reference numerals for the sake of simplicity. Moreover, inasmuch as the construction and mode of operation of the two embodiments correspond to each other, a description of the relevant parts of the second embodiment is omitted for the sake of simplicity, and reference is made in this respect to the illustrations relating to Figures 1 to 10.

As may be seen from the illustration of Figure 11, the horizontally movable table part 16 has an upwardly extending projection 68 in the region of its end remote from the cutting plane. This projection has two pneumatic cylinders 26 spaced apart from each other on its side facing the cutting plane. The vertically extendable piston rods of these pneumatic cylinders act on the underside of a plate-shaped, horizontally oriented base 69, into which the table plate 29 which is associated with the second field region 32 of the output field can be inserted. A vertically disposed strut 70 extending over the width of the table plate 29 connects the underside of the base 69 to the end of the table plate 35 remote from the cutting

plane, which is disposed parallel to the table plate 29. The table plate 35 serves exclusively as a bearing part for the first guide plate 41. In contrast to the embodiment described previously, it thus does not comprise a third field region 36 of the output field and also of course terminates with its end edge facing the cutting plane at a greater distance from the facing end edge of the table plate 21, which is associated with the first field region 22 of the output field.

The facility of removing the table plate 29 from the base 69 when the first guide plate 41 is at its operating height serves the purpose of enabling the operator to monitor the progress of the cutting operation unimpeded. The table plate 29 is thus always removed when block-type products are being cut over a long period of time using the first guide plate 41 and are to be fed to a further processing station.

An adjusting cylinder 71 on the table plate 35 can be moved in and opposite to the direction of advance in a manner which is described in detail below. The piston rod 72 of the adjusting cylinder 71 is positioned at a slight distance from the surface of the table plate 35, and its free end facing the cutting plane receives the lower end of the first guide plate 41 so that the latter can swivel.

The pneumatic cylinder 43 is mounted on top of the adjusting cylinder 71, and its piston rod 44 acts on the first guide plate 41 at a distance from the latter's swivel point.

When the piston rods 28 of the pneumatic cylinders 26 are extended, the base 69 carrying the table plate 29 raises, via the strut 70, the table plate 35 and the adjusting cylinder 71 with the pneumatic cylinder 43 and the first guide plate 41 situated on it. Lateral guides for the table plate 35 and the base 69, which guides are not shown, ensure the accurate lifting movement of the additional table part 73 which is essentially formed by the base 69 with the table plate 69, the strut 70 and the table plate 35. As can be seen particularly clearly from Figures 13 and 14, which illustrate the raised position of the table part 73, the adjusting cylinder 71 is connected via vertical guides 74 to the format adjusting slide 75, which can be moved in and opposite to the direction of advance by means of two advance spindles 76 disposed parallel to each other. The format adjusting slide 75 is guided in the longitudinally

extending region of the table part 16. The advance spindles 76 which drive it are connected to a drive 40 which is mounted in the vertical region of the table part 16. When the table part 16 is raised, the vertical guides 74 rigidly attached to the adjusting cylinder 71 move relatively in the associated guide faces of the format adjusting slide 75. When the table plate 35 is in its raised position, the adjusting cylinder 71 can then be moved opposite to the direction of advance by a corresponding travel of the format adjusting slide 75, by means of which a defined product format can be predetermined between the first guide plate 41 and the second guide plate 48, which can also swivel. In detail, the table plate 35 is provided with slots, which are not shown, but which extend in the direction of advance, and which run through the plate-shaped vertical guides 74 aligned in the direction of advance and thus ensure that the adjusting cylinder 71 is not only be movable but is also guided on the table plate 35.

Figure 11 shows the device with the table plate 29 lowered, wherein the output field is composed of the first field region 22 associated with the table plate 21, the second field region 32 associated with the table plate 29 and a further field region 78 attached thereto, which constitutes the upper limit of the projection 68 of the first table part 16. Figure 11 shows the device with this basic arrangement of the output field following a main cut. Figure 12 shows the device with the gap open and with the second guide plate 48 extended, after it has pushed the cut product completely on to the first field region 22 of the output field. The product may comprise either block strips or blocks. In the illustrations shown in Figures 13 and 14, blocks are already situated on the table plate 21. The table part 73 is then extended by means of the pneumatic cylinders 26 when the format adjusting slide 75 has moved back, i.e. has moved in the direction of advance, the first guide plate 41 being positioned with its lower end at a slight distance from the plane of the first field region 22 of the output field. The format adjusting slide 75 is then moved in the direction of the cutting plane in accordance with the format of the blocks to be cut. The situation after the cut is as shown in Figure 13, corresponding to the illustration of Figure 7, in which the individual blocks are skew in the form of parallelograms and are supported by the first guide plate 41 with the adjusting cylinders 71 retracted. The second guide plate 48 is then extended in the direction of advance after the horizontal travel of the first table part 16, and before the cut material is transferred by the second guide plate 48 the format adjusting slide

75 is moved away from the material by the extent of the transfer distance. After the first guide plate 41 has swung into its vertical position by means of the pneumatic cylinders 43 and after the ejector 53 has been lowered behind the blocks, the situation before the blocks are ejected is as shown in Figure 14.

List of reference numerals

- | | |
|----|--|
| 1 | Base frame |
| 2 | Table area |
| 3 | Field of action |
| 4 | Input field |
| 5 | Material to be cut |
| 5' | Cut material |
| 6 | Forward feed device |
| 7 | Fixed stop |
| 8 | Frame part |
| 9 | Crosshead of press |
| 10 | Cutting knife |
| 11 | Cutting strip |
| 12 | Front edge |
| 13 | Cutting plane |
| 14 | Support |
| 15 | Guide rail |
| 16 | Table part |
| 17 | Pneumatic cylinder |
| 18 | Cylinder housing |
| 19 | Piston rod |
| 20 | Support stay |
| 21 | Table plate |
| 22 | First field region of the output field |
| 23 | Front end |
| 24 | Rear end |
| 25 | Gap |
| 26 | Pneumatic cylinder |
| 27 | Cylinder housing |
| 28 | Piston rod |
| 29 | Table plate |

- 30 Central longitudinal axis
- 31 Indent
- 32 Second field region of the output field
- 33 Rear end
- 34 Connection plate
- 35 Table plate
- 36 Third field region of the output field
- 37 Rear end
- 38 Toothed rack
- 39 Bearing
- 40 Drive
- 41 First guide plate
- 42 Swivelling axis
- 43 Pneumatic cylinder
- 44 Piston rod
- 45 Cylinder housing
- 46 Pneumatic cylinder
- 47 Piston rod
- 48 Second guide plate
- 49 Upper edge
- 50 Pneumatic cylinder
- 51 Piston rod
- 52 Support stay
- 53 Ejector
- 54 Cylinder housing
- 55 Bearing element
- 56 Horizontal guide
- 57 Support rod
- 58 Support rod
- 59 Light box arrangement
- 60 Feed guide plate
- 61 Flat scissor-type stays

- 62 Pneumatic cylinder
- 63 Front face
- 64 Support element
- 65 Spring
- 66 Recess
- 67 Transverse channel
- 68 Projection
- 69 Base
- 70 Strut
- 71 Adjusting cylinder
- 72 Piston rod
- 73 Table part
- 74 Vertical guide
- 75 Format adjusting slide
- 76 Advance spindle
- 78 Field region

Claims:

1. A device for cutting stacked sheet material, with a table area (2) which has a field of action above which a cutting knife (10) and a crosshead (9) of a press are located, wherein the table area has an input field (4) behind the field of action for receiving the material (5) to be cut and an output field (22, 32) in front of the field of action for receiving the cut material (5), and with a forward feed device (6) for the material (5) to be cut, wherein the output field (22, 32) is movable in relation to the field of action (3) with the formation of a gap (25), wherein a transverse channel (67) leading to a further processing station is provided on the output field (22, 32), which transverse channel is formed by a first guide plate (41) which can be brought into an operating position and which cooperates with the output field (22, 32), and a second guide plate (48) behind the first guide plate, which second guide plate can be brought into its operating position after the gap (25) has opened, and wherein an ejector (53) is provided, which is movable along the transverse channel (67), characterised in that the output field (22, 32) is subdivided into a first field region (22) adjacent to the field of action (3) and a second field region (32) disposed in front of the first field region, that the first guide plate (41) is disposed below the output field in the region of the interface between the two field regions (22, 32), that the second field region (32) can be raised from the position forming a plane with the first field region (22), and that the first guide plate (41) can be raised and brought into the operating position with the first field region (22) of the output field.
2. A device according to claim 1, characterised in that a bearing part (35) for the first guide plate (41) is disposed parallel to and below the second field region (32), wherein the guide plate (41) is disposed between the bearing part (35) and the second field region (32), and that the second field region (32) and the bearing part (35) are attached to each other (parts 34; 70) and can be raised and lowered with each other.



3. A device according to claim 2, characterised in that the clear distance between the second field region (32) and the bearing part (35) is greater than the maximum stack thickness of the cut material (5').
4. A device according to claims 2 or 3, characterised in that the width of the transverse channel (67) is approximately as great as the extent of the first field region (22) between the field of action (3) and the second field region (32).
5. A device according to any one of claims 1 to 4, characterised in that a first table part (16) is mounted in a base frame (1, 14, 14) so that it can travel horizontally in and opposite to the direction of advance (C) of the material to be cut (5), wherein this table part (16) accommodates the first field region (22), and wherein a second table part (73), which accommodates the bearing part (35) and the second field region (32) which are disposed parallel to one another, is mounted so that it can be raised and lowered in the first table part (16).
6. A device according to claim 5, characterised in that the second table part (73) is mounted in vertical guides in the first table part (16), and that lifting elements (26) for raising and lowering the second table part (73) engage with a base (69) for the second field region (32) which can be detached from the latter, and with the first table part (16).
7. A device according to any one of claims 1 to 6, characterised in that the first guide plate (41) is mounted in the bearing part (35).
8. A device according to any one of claims 1 to 7, characterised in that the first guide plate (41) can travel in and opposite to the direction of advance (C) of the material (5) to be cut.
9. A device according to claim 8, characterised in that the first guide plate (41) can travel between an end position associated with the first field region (22) and an end position associated with the bearing part (35).



10. A device according to any one of claims 1 to 9, characterised in that the first guide plate (41) can swing between two operating positions, wherein in a first position it is inclined substantially corresponding to the bevel of the cutting knife (10) and in a second position stands substantially perpendicular to the table area (2, 22).
11. A device according to any one of claims 1 to 10, characterised in that the bearing part (35) forms a third field region (35) of the input field, which is disposed parallel to the second field region (32) and can be raised into the plane of the first field region (22).
12. A device according to any one of claims 1 to 11, characterised in that in its rest position the second guide plate (48) is disposed below the first field region (22) of the output field and can be brought through the gap (25) into its operating position, in which the second guide plate (48) is seated against the rear edge (24) of the first field region (22) over the entire length of the interface between the field of action (3) and the first field region (22) of the output field, and stands substantially perpendicular to the table area (2, 22, 32).
13. A device according to claim 12, characterised by a movable support element (64) mounted in front of the second guide plate (48), which supports the material (5') which was the last to be cut and which projects beyond the rear edge (24) of the first field region (22), at least at the level of the cut material contact surface of this field region (22), wherein the support element (64) is moved back into the plane of the guide plate when the operating position of the second guide plate (48) is reached.
14. A device according to claim 13, characterised in that the second guide plate (48) is provided with at least one support element (64), wherein the support element (64) has an upper free end and is swung from a first into a second end position when there is a final relative movement of the second guide plate (48) and the first field region (22) to reach the operating position of the second guide plate (48), in such a way that in the first end position, where it is swung out from the guide plate contact surface in the direction of the first field region, the free end of the support element (64) comes



to lie below the plane formed by the cut material contact surface of this field region (22), and in the second end position, where it is swung into the guide plate (48), the free end of the support element comes to lie in the plane of the cut material contact surface of this field region (22).

15. A device according to any one of claims 1 to 14, characterised in that the second guide plate (48) accommodates, on its face which faces the material (5) to be cut, a feed guide plate (60) which can be placed on this face of the material (5) to be cut.
16. A device according to claim 15, characterised in that the feed guide plate (60) can be placed on the material (5) to be cut, at least in the region of the upper sheets of the latter.
17. A device according to claims 15 or 16, characterised in that the feed guide plate (60) is mounted in the second guide plate (48) by means of a plurality of scissor-type flat stays (61).

