(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 604 356 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
11.02.2015 Bulletin 2015/07

(21) Application number: **12197319.2**

(22) Date of filing: **14.12.2012**

(51) Int Cl.:
B21D 24/02 *(2006.01)* ***B21D 24/16*** *(2006.01)*
B21D 24/08 *(2006.01)* ***B21D 37/08*** *(2006.01)*

(54) **Press die**

Druckpresse

Matrice de presse

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **16.12.2011 KR 20110136009**

(43) Date of publication of application:
19.06.2013 Bulletin 2013/25

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Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a press die, particularly but not exclusively to a press die capable of simultaneously performing a drawing process and a trimming process.

[0002] In general, a press die includes a first die having a first die surface provided with a shape that corresponds to one side surface of a product to be manufactured, and a second die having a second die surface provided with a shape that corresponds to the other side surface of the product to be manufactured. The press die is an apparatus configured to couple the first die and the second die after a panel is disposed in between the first die and the second die, so that the panel disposed in between the first die and the second die may be deformed into the shape that corresponds to the first die surface and the second die surface.

[0003] The press die as such includes a composition type press die, which is provided with a drawing unit configured to hold a panel to perform a drawing process on the panel and a trimming unit configured to perform a trimming process by cutting the panel to form a hole.

[0004] Therefore, it is an aspect of the present disclosure to provide a press die capable of performing both of a drawing process and a trimming process by only using small fluid pressure. Additional aspects of the disclosure will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the disclosure.

[0005] EP1844871 discloses a press working apparatus having first and second dies and a punch, in which the punch is prepared and used to punch a steel plate during a second press working operation following a first press working operation in which the plate is drawn.

[0006] According to the invention, there is provided a press die according to claim 1.

[0007] In accordance with the invention, a press die includes a first die, a second die, a drawing unit, a trimming unit and a fluid pressure controlling unit. The second die is disposed opposite to the first die to perform a press work on a panel together with the first die. The drawing unit is configured to hold the panel. The trimming unit is configured to cut the panel. The fluid pressure controlling unit is configured to selectively deliver fluid pressure to one of the drawing unit and the trimming unit. One of the first die and the second die may be moved toward the other one of the first die and the second die.

[0008] The first die may include a first core provided with a first die surface having a shape that corresponds to one side surface of a product to be manufactured. The second die may include a second core provided with a second die surface having a shape that corresponds to the other side surface of the product to be manufactured, the second core provided with a drawing surface to hold the panel. The drawing unit may include a drawing member and a drawing actuator. The drawing member may be disposed opposite to the drawing surface so that the panel is held in between the drawing member and the drawing surface. The drawing actuator may be configured to move the drawing member according to the delivered fluid pressure.

[0009] The drawing actuator may include a drawing cylinder to which fluid pressure is delivered, and a drawing piston movably installed at the drawing cylinder so as to move according to an inside pressure of the drawing cylinder.

[0010] The trimming unit may include a trimming member and a trimming actuator. The trimming member may penetrate through one of the first core and the second core and protrude toward the other one of the first core and the second core. The trimming actuator may be configured to move the trimming member according to the delivered fluid pressure. One of the first core and the second core may include a penetrating hole at which the trimming member is installed. The other one of the first core and the second core may include a trimming hole provided at a position that corresponds to the penetrating hole.

[0011] The trimming actuator may include a trimming cylinder to which fluid pressure is delivered, and a trimming piston movably installed at the trimming cylinder so as to move according to an inside pressure of the trimming cylinder.

[0012] The press die further includes a first delivery tube and a second delivery tube. The first delivery tube connects the drawing unit to the fluid pressure controlling unit. The second delivery tube connects the trimming unit to the fluid pressure controlling unit.

[0013] The fluid pressure controlling unit is configured to deliver fluid pressure from one of the drawing unit and the trimming unit to the other one of the drawing unit and the trimming unit.

[0014] As described above, the press die includes the fluid pressure controlling unit configured to selectively deliver fluid pressure to one of the drawing unit and the trimming unit, and both of the drawing unit and the trimming unit may be operated even with a small fluid pressure.

[0015] These and/or other aspects of the disclosure will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings in which:

FIG. 1 is a schematic view of a press die in accordance with one embodiment of the present disclosure.
FIGS. 2, 3 and 4 are schematic views sequentially showing an operation of the press die in accordance with the embodiment of the present disclosure.

[0016] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

[0017] Referring to FIG. 1, a press die in accordance with one embodiment of the present disclosure includes

a first die 10, and a second die 20 disposed opposite to the first die 10, to perform presswork, ie. a pressing operation, on a panel 'P' together with the first die 1. In the embodiment, the second die 20 is movably installed in a vertical direction at an upper side of the first die 10 disposed at a floor, so that, as the second die 20 moves upward/downward, the second die 20 may be coupled to the first die 10 or may be separated from the first die 10.

[0018] In addition, the press die includes a drawing unit 30 configured to hold the panel 'P' to perform a drawing process on the panel 'P', a trimming unit 40 to cut the panel 'P', and a fluid pressure controlling unit 50 configured to deliver fluid pressure such as hydraulic pressure or pneumatic pressure to the drawing unit 30 and to the trimming unit 40.

[0019] The first die 10 includes a first core 11 provided with a first die surface 11a having the shape that corresponds to one side surface of a product to be manufactured, a first fixing panel 12 fixed to an opposite side surface of the first die surface 11a of the first core 11, and a first base 13 disposed at a lower side of the first fixing panel 12 and supported at a ground level.

[0020] The second die 20 includes a second core 21 provided with a second die surface 21a having the shape that corresponds to the other side surface of the product to be manufactured, and with a drawing surface 21b formed alongside the second die surface 21a to hold the panel 'P'. The second die 20 also includes a second fixing panel 22 fixed to an opposite side surface of the second die surface 21a of the second core 21.

[0021] The drawing unit 30 includes a drawing member 31 disposed alongside the first core 11 at a side of the first core 11 while disposed opposite to the drawing surface 21b of the second core 21, and a drawing actuator 32 being delivered with fluid pressure from the fluid pressure controlling unit 50 to move the drawing member 31. In the embodiment, the drawing actuator 32 includes a drawing cylinder 32a to which fluid pressure is delivered, and a drawing piston 32b configured to move the drawing member 31 while moving according to the inside pressure of the drawing cylinder 32a.

[0022] The trimming unit 40 includes a trimming member 41 protruded toward the first core 11 after penetrating through the second core 21, and a trimming actuator 42 being delivered with fluid pressure from the fluid pressure controlling unit 50 to move the trimming member 41. In the embodiment, the trimming actuator 42 includes a trimming cylinder 42a to which fluid pressure is delivered, and a trimming piston 42b configured to move the trimming member 41 while moving according to the inside pressure of the trimming cylinder 42a.

[0023] The first core 11 has a trimming hole 11b provided with the position and the shape that correspond to the trimming member 41 so that a front end of the trimming member 41 protruded from the second core 21 is entered through the trimming hole 11b. The second core 21 and the second fixing panel 22 are provided with penetrating holes 21c and 22a, respectively, at which the trimming member 41 is penetratively installed.

[0024] The fluid pressure controlling unit 50 includes a hydraulic pump that generates fluid pressure, and is configured in a way to be connected to the drawing unit 30 and the trimming unit 40 through delivering tubes 51 and 52, so that fluid pressure may selectively be delivered to one of the drawing unit 30 and the trimming unit 40. The delivering tubes 51 and 52 include the first delivering tube 51 connecting in between the drawing unit 30 and the fluid pressure controlling unit 50, and the second delivering tube 52 connecting in between the trimming unit 40 and the fluid pressure controlling unit 50. In addition, in the embodiment, the fluid pressure controlling unit 50 is configured to deliver fluid pressure from one of the drawing unit 30 and the trimming unit 40 to the other one of the drawing unit 30 and the trimming unit 40.

[0025] Next, the operation of the press die composed as such is as follows:

First, in a state that the second die 20 is spaced apart from the first die 10 and in a state that the panel 'P' is placed on the first die 10 and the drawing member 31, the second die 20 is moved toward the first die 10.

[0026] As illustrated in FIG. 2, when the drawing surface 21b of the second die 20 is arrived at the panel 'P' according to the movement of the second die 20, the fluid pressure controlling unit 50 delivers fluid pressure to the drawing actuator 32. According to such, the panel 'P' is being held in between the drawing surface 21b and the drawing member 31.

[0027] As illustrated in FIG. 3, in a state when the holding is completed, the second die 20 is continuously moved toward the first die 10 so that the second die 20 and the first die 10 are coupled to each other. As described above, the panel 'P' is in the state of being held in between the drawing surface 21b and the drawing member 31, and thus the panel 'P' is deformed into the shape that corresponds to the first die surface 11a and the second die surface 21a. That is, the panel 'P' is subject to a drawing process.

[0028] After the drawing processing is completed, the fluid pressure controlling unit 50 delivers fluid pressure from the drawing actuator 32 to the trimming actuator 42. By the fluid pressure delivered to the trimming actuator 42, the trimming member 41, as illustrated in FIG. 4, is protruded toward the second core 21 and is entered through the trimming hole 11b provided at the second die 20. However, since the panel 'P' having been subjected to the drawing process is interpositioned in between the first core 11 and the second core 21, the panel 'P' is cut into the shape that corresponds to the trimming member 41 and the trimming hole 11b. That is, the panel 'P', after being subjected to the drawing process, is subjected to the trimming process.

[0029] As described above, the fluid pressure controlling unit 50 is configured to selectively deliver fluid pressure to one of the drawing unit 30 and the trimming unit

40, and as such if the fluid pressure being delivered to the drawing unit 30 and the trimming unit 40 is made to be controlled by the fluid pressure controlling unit 50, the drawing unit 30 and the trimming unit 40 are operated while being interlocked to each other, and thus both of the drawing process and the trimming process may be performed on the panel 'P' even by only using small fluid pressure.

[0030] In the embodiment, the fluid pressure controlling unit 50, as described above, is configured to deliver fluid pressure from one of the drawing unit 30 and the trimming unit 40 to the other one of the drawing unit 30 and the trimming unit 40, and thus both of the drawing unit 30 and the trimming unit 40 may be operated even through small amount of fluid pressure.

[0031] In the embodiment, the trimming unit 40 is disposed at the second die 20, but the present disclosure is not limited hereto, and having the trimming unit 40 disposed at the first die 10 may also be possible.

[0032] Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the scope of the claims.

Claims

1. A press die, comprising:

a first die (10);
a second die (20) disposed opposite to the first die to perform presswork on a panel together with the first die;
a drawing unit (30) configured to hold the panel;
characterised in that the press die further comprises a trimming unit (40) configured to cut the panel; and
a fluid pressure controlling unit (50) configured to selectively deliver fluid pressure to one of the drawing unit (30) and the trimming unit (40), further comprising:

a first delivery tube (51) connecting the fluid pressure controlling unit (50) to the drawing unit (30) for providing fluid from the fluid pressure controlling unit (50) to the drawing unit (30); and
a second delivery tube (52) connecting the fluid pressure controlling unit (50) to the trimming unit (40) for providing fluid from the fluid pressure controlling unit (50) to the trimming unit (40),
wherein the fluid pressure controlling unit (50) is configured to deliver fluid pressure from one of the drawing unit (30) and the trimming unit (40) to the other one of the drawing unit (30) and the trimming unit (40).

2. The press die of claim 1, wherein one of the first die (10) and the second die (20) is arranged to be moved towards the other one of the first die and the second die.

3. The press die of claim 1 or 2, wherein:

the first die (10) comprises a first core (11) provided with a first die surface (11a) having a shape that corresponds to one side surface of a product to be manufactured;
the second die (20) comprises a second core (21) provided with a second die surface (21a) having a shape that corresponds to other side surface of the product to be manufactured, the second core provided with a drawing surface (21b) to hold the panel; and
the drawing unit (30) comprises a drawing member (31) disposed opposite to the drawing surface (21b) so that the panel is held in between the drawing member and the drawing surface, and a drawing actuator (32) configured to move the drawing member according to the delivered fluid pressure.

4. The press die of claim 3, wherein the drawing actuator (32) comprises a drawing cylinder (32a) to which fluid pressure is delivered, and a drawing piston (32b) movably installed at the drawing cylinder so as to move according to an inside pressure of the drawing cylinder.

5. The press die of claim 3 or 4, wherein:

the trimming unit (40) comprises a trimming member (41) penetrating through one of the first core and the second core and protruding toward the other one of the first core and the second core, and a trimming actuator (42) configured to move the trimming member according to the delivered fluid pressure,
one of the first core and the second core comprises a penetrating hole at which the trimming member is installed, and
the other one of the first core and the second core comprises a trimming hole provided at a position that corresponds to the penetrating hole.

6. The press die of claim 5, wherein the trimming actuator comprises a trimming cylinder (42a) to which fluid pressure is delivered, and a trimming piston (42b) movably installed at the trimming cylinder so as to move according to an inside pressure of the trimming cylinder.

7. The press die of claim 1, wherein the second die includes a drawing surface (21b) to hold the panel,

and
the drawing unit (30) comprises a drawing member (31) disposed opposite to the drawing surface so that the panel is held in between the drawing member and the drawing surface, and a drawing actuator (32) to move the drawing member according to the delivered fluid pressure.

8. The press die of claim 7, wherein the drawing actuator comprises:

a drawing cylinder (32a) to which fluid pressure is delivered; and
a drawing piston (32b) movably installed at the drawing cylinder so as to move according to an inside pressure of the drawing cylinder.

9. The press die of claim 1, wherein the trimming unit (40) comprises a trimming member (41) penetrating through one of the first and second dies and protruding toward the other one of the first and second dies, and a trimming actuator (42) to move the trimming member according to the delivered fluid pressure,
one of the first and second dies includes a penetrating hole (22a) at which the trimming member is installed, and
the other one of the first and second dies includes a trimming hole (11b) provided at a position that corresponds to the penetrating hole.

10. The press die of claim 9, wherein the trimming actuator comprises:

a trimming cylinder (42a) to which fluid pressure is delivered; and
a trimming piston (42b) movably installed at the trimming cylinder so as to move according to an inside pressure of the trimming cylinder.

Patentansprüche

1. Presswerkzeug, umfassend:

einen ersten Stempel (10),
einen zweiten Stempel (20), der dem ersten Stempel entgegengesetzt angeordnet ist, um zusammen mit dem ersten Stempel Pressarbeit an einer Tafel durchzuführen,
eine Tiefzieheinheit (30), die zum Aufnehmen der Tafel gestaltet ist,
dadurch gekennzeichnet, dass das Presswerkzeug ferner Folgendes aufweist:

eine Schneideinheit (40), die zum Schneiden der Tafel gestaltet ist, und
eine Fluiddruckregeleinheit (50), die zum selektiven Zuführen von Fluiddruck zu der Tiefzieheinheit (30) oder der Schneideinheit (40) gestaltet ist, ferner aufweisend:

ein erstes Zuführrohr (51), welches die Fluiddruckregeleinheit (50) mit der Tiefzieheinheit (30) verbindet, um die Tiefzieheinheit (30) mit Fluid von der Fluiddruckregeleinheit (50) zu versorgen, und
ein zweites Zuführrohr (52), welches die Fluiddruckregeleinheit (50) mit der Schneideinheit (40) verbindet, um die Schneideinheit (40) mit Fluid von der Fluiddruckregeleinheit (50) zu versorgen,
wobei die Fluiddruckregeleinheit (50) zum Zuführen von Fluiddruck von der Tiefzieheinheit (30) oder der Schneideinheit (40) zu der Schneideinheit (40) bzw. der Tiefzieheinheit (30) gestaltet ist.

2. Presswerkzeug nach Anspruch 1, wobei der erste Stempel (10) oder der zweite Stempel (20) angeordnet ist, um zum zweiten Stempel bzw. zum ersten Stempel hin bewegt zu werden.

3. Presswerkzeug nach Anspruch 1 oder 2, wobei:

der erste Stempel (10) einen ersten Kern (11) aufweist, der mit einer ersten Stempelfläche (11a) versehen ist, die eine Form hat, die einer Seitenfläche eines herzustellenden Produkts entspricht,
der zweite Stempel (20) einen zweiten Kern (21) aufweist, der mit einer zweiten Stempelfläche (21a) versehen ist, die eine Form hat, die der anderen Seitenfläche des herzustellenden Produkts entspricht, wobei der zweite Kern mit einer Tiefziehfläche (21b) zum Aufnehmen der Tafel versehen ist, und
die Tiefzieheinheit (30) ein Tiefziehelement (31), das gegenüber der Tiefziehfläche (21b) angeordnet ist, so dass die Tafel zwischen dem Tiefziehelement und der Tiefziehfläche aufgenommen ist, und einen Tiefziehstellantrieb (32), der zum Bewegen des Tiefziehelements in Übereinstimmung mit dem zugeführten Fluiddruck gestaltet ist, aufweist.

4. Presswerkzeug nach Anspruch 3, wobei der Tiefziehstellantrieb (32) einen Tiefziehzylinder (32a), dem Fluiddruck zugeführt wird, und einen Tiefziehkolben (32b), der beweglich an dem Tiefziehzylinder installiert ist, um sich in Übereinstimmung mit einem Innendruck des Tiefziehzylinders zu bewegen, aufweist.

5. Presswerkzeug nach Anspruch 3 oder 4, wobei:

die Schneideinheit (40) ein Schneidelement (41), das durch den ersten Kern oder den zweiten Kern dringt und in Richtung auf den zweiten Kern bzw. den ersten Kern vorsteht, und einen Schneidstellantrieb (42), der zum Bewegen des Schneidelements in Übereinstimmung mit dem zugeführten Fluiddruck gestaltet ist, aufweist,
der erste Kern oder der zweite Kern ein Penetrationsloch aufweist, an dem das Schneidelement installiert ist, und
der zweite bzw. der erste Kern ein Schneidloch aufweist, das an einer Position vorgesehen ist, die dem Penetrationsloch entspricht.

6. Presswerkzeug nach Anspruch 5, wobei der Schneidstellantrieb einen Schneidzylinder (42a), dem Fluiddruck zugeführt wird, und einen Schneidkolben (42b), der beweglich an dem Schneidzylinder installiert ist, um sich in Übereinstimmung mit einem Innendruck des Schneidzylinders zu bewegen, aufweist.

7. Presswerkzeug nach Anspruch 1, wobei der zweite Stempel eine Tiefziehfläche (21b) zum Aufnehmen der Tafel beinhaltet, und
die Tiefzieheinheit (30) ein Tiefziehelement (31), das gegenüber der Tiefziehfläche angeordnet ist, so dass die Tafel zwischen dem Tiefziehelement und der Tiefziehfläche aufgenommen ist, und einen Tiefziehstellantrieb (32) zum Bewegen des Tiefziehelements in Übereinstimmung mit dem zugeführten Fluiddruck aufweist.

8. Presswerkzeug nach Anspruch 7, wobei der Tiefziehstellantrieb Folgendes aufweist:

einen Tiefziehzylinder (32a), dem Fluiddruck zugeführt wird, und
einen Tiefziehkolben (32b), der beweglich an dem Tiefziehzylinder installiert ist, um sich in Übereinstimmung mit einem Innendruck des Tiefziehzylinders zu bewegen.

9. Presswerkzeug nach Anspruch 1, wobei die Schneideinheit (40) ein Schneidelement (41), das durch den ersten oder den zweiten Stempel dringt und in Richtung auf den zweiten bzw. den ersten Stempel vorsteht, und einen Schneidstellantrieb (42), der zum Bewegen des Schneidelements in Übereinstimmung mit dem zugeführten Fluiddruck gestaltet ist, aufweist,
der erste oder der zweite Stempel ein Penetrationsloch (22a) beinhaltet, an dem das Schneidelement installiert ist, und
der zweite bzw. der erste Stempel ein Schneidloch (11b) beinhaltet, das an einer Position vorgesehen ist, die dem Penetrationsloch entspricht.

10. Presswerkzeug nach Anspruch 9, wobei der Schneidstellantrieb Folgendes aufweist:

einen Schneidzylinder (42a), dem Fluiddruck zugeführt wird, und
einen Schneidkolben (42b), der beweglich an dem Schneidzylinder installiert ist, um sich in Übereinstimmung mit einem Innendruck des Schneidzylinders zu bewegen.

Revendications

1. Matrice de presse, comportant :

une première matrice (10) ;
une deuxième matrice (20) disposée à l'opposé par rapport à la première matrice pour effectuer un travail à la presse sur un panneau avec la première matrice ;
une unité d'emboutissage (30) configurée à des fins de retenue du panneau ;
caractérisée en ce que la matrice de presse comporte par ailleurs
une unité d'ébavurage (40) configurée à des fins de découpe du panneau ; et
une unité de régulation de pression hydraulique (50) configurée à des fins de distribution sélective de pression hydraulique à l'une parmi l'unité d'emboutissage (30) et l'unité d'ébavurage (40), comportant par ailleurs :

un premier tube de distribution (51) raccordant l'unité de régulation de pression hydraulique (50) à l'unité d'emboutissage (30) à des fins de distribution de fluide en provenance de l'unité de régulation de pression hydraulique (50) jusqu'à l'unité d'emboutissage (30) ; et
un deuxième tube de distribution (52) raccordant l'unité de régulation de pression hydraulique (50) à l'unité d'ébavurage (40) à des fins de distribution de fluide en provenance de l'unité de régulation de pression hydraulique (50) jusqu'à l'unité d'ébavurage (40),
dans laquelle l'unité de régulation de pression hydraulique (50) est configurée à des fins de distribution de pression hydraulique en provenance de l'une parmi l'unité d'emboutissage (30) et l'unité d'ébavurage (40) jusqu'à l'autre parmi l'unité d'emboutissage (30) et l'unité d'ébavurage (40).

2. Matrice de presse selon la revendication 1, dans laquelle l'une parmi la première matrice (10) et la

deuxième matrice (20) est agencée à des fins de déplacement vers l'autre parmi la première matrice et la deuxième matrice.

3. Matrice de presse selon la revendication 1 ou la revendication 2, dans laquelle :

la première matrice (10) comporte un premier noyau (11) étant doté d'une première surface de matrice (11a) ayant une forme qui correspond à une surface latérale d'un produit devant être fabriqué ;
la deuxième matrice (20) comporte un deuxième noyau (21) étant doté d'une deuxième surface de matrice (21a) ayant une forme qui correspond à une autre surface latérale du produit devant être fabriqué, le deuxième noyau étant doté d'une surface d'emboutissage (21b) à des fins de retenue du panneau ; et
l'unité d'emboutissage (30) comporte un élément d'emboutissage (31) disposé à l'opposé par rapport à la surface d'emboutissage (21b) de telle sorte que le panneau est retenu entre l'élément d'emboutissage et la surface d'emboutissage, et un actionneur d'emboutissage (32) configuré à des fins de déplacement de l'élément d'emboutissage en fonction de la pression hydraulique distribuée.

4. Matrice de presse selon la revendication 3, dans laquelle l'actionneur d'emboutissage (32) comporte un cylindre d'emboutissage (32a) dans lequel la pression hydraulique est distribuée, et un piston d'emboutissage (32b) installé de manière mobile au niveau du cylindre d'emboutissage à des fins de déplacement en fonction d'une pression intérieure du cylindre d'emboutissage.

5. Matrice de presse selon la revendication 3 ou la revendication 4, dans laquelle :

l'unité d'ébavurage (40) comporte un élément d'ébavurage (41) pénétrant au travers de l'un parmi le premier noyau et le deuxième noyau et faisant saillie vers l'autre parmi le premier noyau et le deuxième noyau, et un actionneur d'ébavurage (42) configuré à des fins de déplacement de l'élément d'ébavurage en fonction de la pression hydraulique distribuée,
l'un parmi le premier noyau et le deuxième noyau comporte un trou de pénétration au niveau duquel l'élément d'ébavurage est installé, et
l'autre parmi le premier noyau et le deuxième noyau comporte un trou d'ébavurage mis en oeuvre au niveau d'une position qui correspond au trou de pénétration.

6. Matrice de presse selon la revendication 5, dans laquelle l'actionneur d'ébavurage comporte un cylindre d'ébavurage (42a) dans lequel la pression hydraulique est distribuée, et un piston d'ébavurage (42b) installé de manière mobile au niveau du cylindre d'ébavurage à des fins de déplacement en fonction d'une pression intérieure du cylindre d'ébavurage.

7. Matrice de presse selon la revendication 1, dans laquelle la deuxième matrice comprend une surface d'emboutissage (21b) à des fins de retenue du panneau, et
l'unité d'emboutissage (30) comporte un élément d'emboutissage (31) disposé à l'opposé par rapport à la surface d'emboutissage de telle sorte que le panneau est retenu entre l'élément d'emboutissage et la surface d'emboutissage, et un actionneur d'emboutissage (32) à des fins de déplacement de l'élément d'emboutissage en fonction de la pression hydraulique distribuée.

8. Matrice de presse selon la revendication 7, dans laquelle l'actionneur d'emboutissage comporte :

un cylindre d'emboutissage (32a) auquel la pression hydraulique est distribuée ; et
un piston d'emboutissage (32b) installé de manière mobile au niveau du cylindre d'emboutissage à des fins de déplacement en fonction d'une pression intérieure du cylindre d'emboutissage.

9. Matrice de presse selon la revendication 1, dans laquelle l'unité d'ébavurage (40) comporte un élément d'ébavurage (41) pénétrant au travers de l'une parmi les première et deuxième matrices et faisant saillie vers l'autre parmi les première et deuxième matrices, et un actionneur d'ébavurage (42) à des fins de déplacement de l'élément d'ébavurage en fonction de la pression hydraulique distribuée,
l'une parmi les première et deuxième matrices comporte un trou de pénétration (22a) au niveau duquel l'élément d'ébavurage est installé, et
l'autre parmi les première et deuxième matrices comporte un trou d'ébavurage (11b) mis en oeuvre au niveau d'une position qui correspond au trou de pénétration.

10. Matrice de presse selon la revendication 9, dans laquelle l'actionneur d'ébavurage comporte :

un cylindre d'ébavurage (42a) dans lequel la pression hydraulique est distribuée ; et
un piston d'ébavurage (42b) installé de manière mobile au niveau du cylindre d'ébavurage à des fins de déplacement en fonction d'une pression intérieure du cylindre d'ébavurage.

FIG. 1

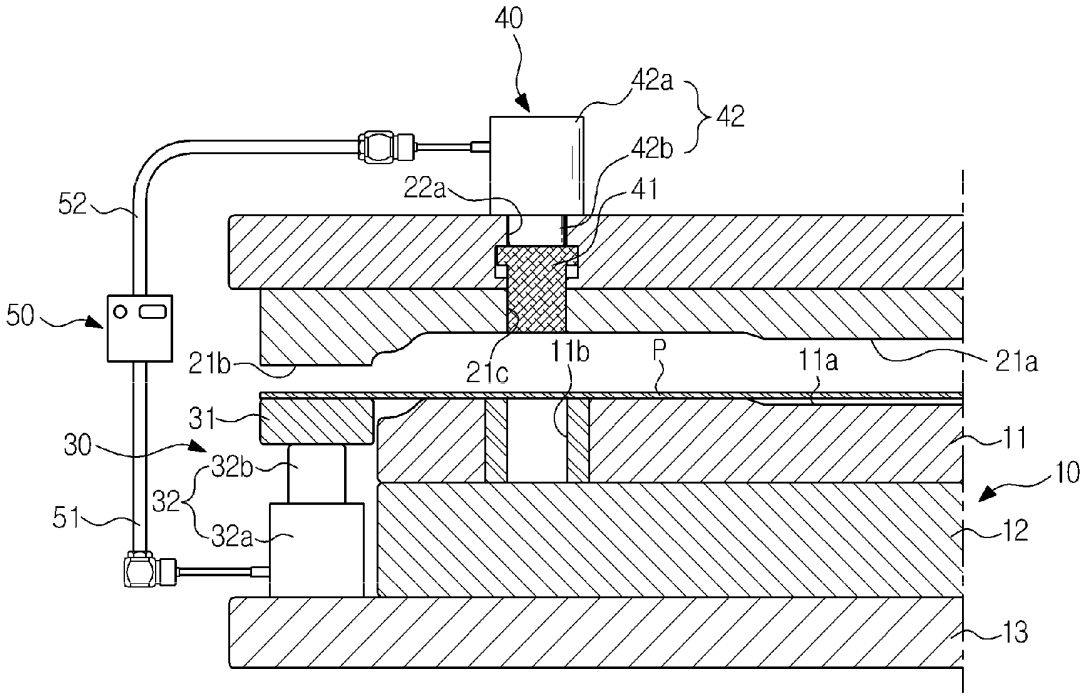

40
42a
42
42b
22a
41
52
50
21b
21c
11b
P
11a
21a
31
30
11
10
32b
32
51
32a
12
13

FIG. 2

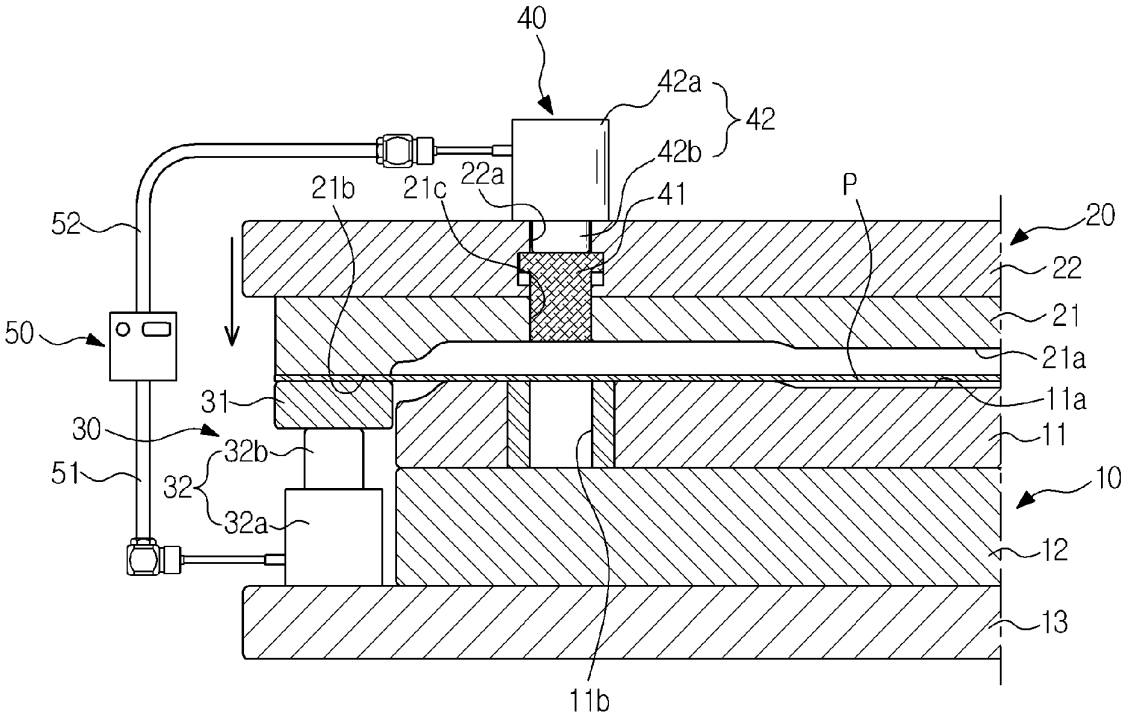

40
42a
42
42b
41
22a
21b
21c
P
20
52
22
21
50
21a
31
11a
30
11
32b
51
32
10
32a
12
13
11b

FIG. 3

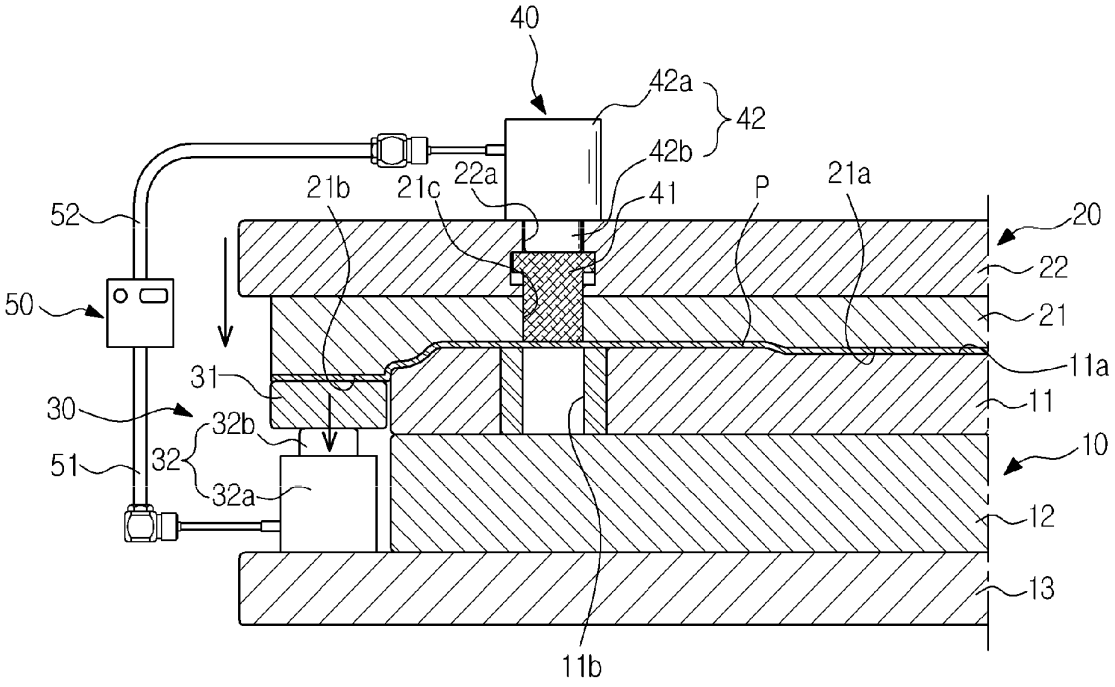
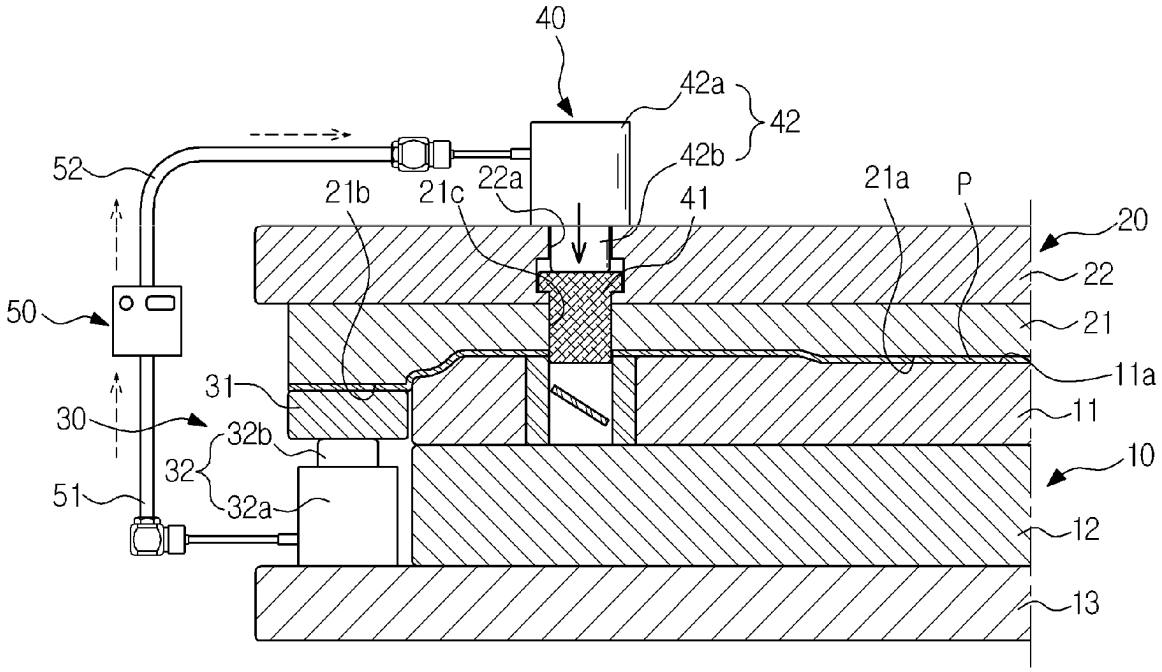

40
42a
42
42b
22a
21b
21c
41
P
21a
20
52
22
50
21
11a
31
30
11
32b
10
51
32
32a
12
13
11b

FIG. 4


40
42a
42
42b
52
21b
21c
22a
41
21a
P
20
22
21
50
11a
31
11
30
32b
10
32
51
32a
12
13

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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