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

(11) **EP 2 682 198 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.01.2014 Bulletin 2014/02

(51) Int Cl.:
B21D 5/02 *(2006.01)* ***B30B 15/00*** *(2006.01)*

(21) Application number: **13163686.2**

(22) Date of filing: **15.04.2013**

(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
Designated Extension States:
BA ME

(30) Priority: **06.07.2012 IT TV20120125**

(71) Applicant: **Gasparini Industries S.r.l.**
31036 Istrana (TV) (IT)

(72) Inventors:
- **Zanini, Augusto**
  31036 Istrana TV (IT)
- **Bizzotto, Stefano**
  36027 Rosa' VI (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners (IT)
Via Meravigli, 16
20123 Milano (IT)

(54) **Cambering device in bending presses**

(57) An active cambering device (1) of bending presses comprising an upper beam (2) and a lower beam (3), the device comprising a pump (4, P1) adapted to load at least one accumulator (5, ACC), which is adapted to actuate the lower beam (3) by means of a proportional direction valve (6, V8).

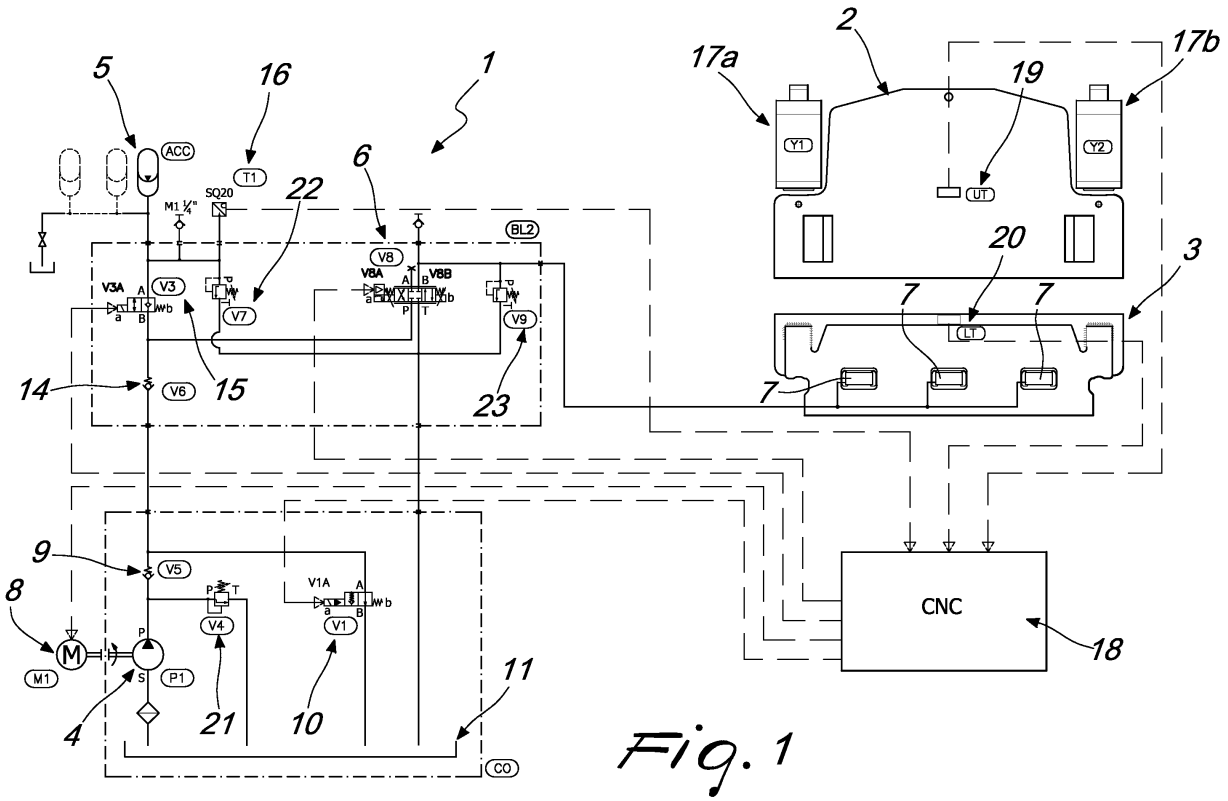

Fig. 1

EP 2 682 198 A1

Description

[0001] The present invention relates to an active cambering device of bending presses.

[0002] Currently, in bending presses, comprising an upper beam and a lower beam, it is known to use a cambering circuit, which comprises a high-capacity pump, in which the deformation of the jacks is controlled by a proportional pressure valve that performs this control by operating on the pressure of the circuit.

[0003] In order to do this, large quantities of oil must be drained and therefore large amounts of energy are wasted uselessly because of the construction of this type of valve.

[0004] Therefore, there are high management costs, also because the time necessary in order to perform the manufacturing cycle increases and therefore productivity decreases.

[0005] The aim of the present invention is therefore to solve the above technical problems, eliminating the drawbacks of the cited background art, by providing a device that makes it possible to achieve higher energy savings.

[0006] Within this aim, an object of the invention is to provide a device that allows activating the press in very short times by supplying, in a set pressure range, large instantaneous oil flows.

[0007] Another object of the invention is to allow the use of only the amount of oil that is necessary, avoiding discharging the pressurized excess uselessly.

[0008] Another object of the invention is to allow having a lower installed power.

[0009] Another object of the invention is to allow achieving a higher reaction speed of the cambering, reducing the cycle time and increasing productivity.

[0010] Another object is to obtain a device that is structurally simple, has low manufacturing costs and can be provided with usual known plants.

[0011] This aim and these and other objects that will become more apparent hereinafter are achieved by an active cambering device of bending presses comprising an upper beam and a lower beam, **characterized in that** it comprises a pump adapted to load at least one accumulator, said accumulator being adapted to actuate said lower beam by means of a proportional direction valve.

[0012] Further characteristics and advantages of the present invention will become more apparent from the detailed description of a particular but not exclusive embodiment, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a hydraulic diagram of a bending press that comprises an accumulator with a capacity of less than one liter, according to the present invention;

Figure 2 is a hydraulic diagram of a bending press that comprises an accumulator with a capacity of more than one liter, according to the present invention;

Figure 3 is a flowchart.

[0013] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0014] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0015] With reference to the previously cited figures, the reference numeral 1 designates an active cambering device of bending presses comprising an upper beam 2 and a lower beam 3.

[0016] In the accompanying drawings, some components have been designated by reference signs that are explained hereinafter:

M1 = asynchronous motor
P1 = pump
V1 = pump discharge electric valve
V2 = electric valve for accumulator discharge on safety block
V3 = accumulator insertion electric valve
V4 = safety valve on control unit
V5 = one-way valve for pump protection
V6 = circuit separation one-way valve
V7 = accumulator oil side safety valve
V8 = proportional direction valve
V9 = safety valve
BL1 = accumulator block
BL2 = cambering block
T I = pressure transducer
ACC = accumulator(s)
UT = position transducer on upper beam
LT = position transducer on lower beam
CNC = numeric control
Y1 = left cylinder
YY1 = left cylinder target level (level to which the left cylinder of the press must be brought in order to perform the set bending)
Y2 = right cylinder
YY2 = right cylinder target level (level to which the right cylinder of the press must be brought in order to perform the set bending)
QUT = level detected by the transducer UT on upper beam
QLT = level detected by the transducer LT on lower beam

[0017] The device comprises a pump 4, P1 adapted to load at least one accumulator 5, ACC, said accumulator being adapted to actuate said lower beam 3 by means of a proportional direction valve 6, V8.

[0018] The position of the slider of the proportional direction valve 6, V8 is continuous and proportional to the current that flows through the coils/solenoids installed therein; in the specific case, the proportional direction valve 6, V8 has three possible positions between which

the slider can move, affecting them both partially and completely.

[0019] There is a first inactive position with closed centers, in which there is no connection between the various branches P (pressurized branch), T (discharge), A (use) and B (use) which arrive at/exit from the proportional direction valve 6, V8, which behaves like a plug, preventing the passage of the oil in any direction.

[0020] There is a second position, designated by V8A, with crossed centers, in which the branch P is connected to the branch B; in this condition the oil flows toward the cambering jacks 7 of the lower beam 3; the branch T is also connected to the branch A; in this condition, since A is plugged, nothing happens.

[0021] There is a third position, designated by V8B, with straight centers: the branch P is thus connected to the branch A (and since A is plugged, nothing happens) and the branch T is connected to the branch B: in this case the oil that arrives from the cambering jacks 7 is discharged.

[0022] The pump 4, P1 is activated at power-on of the machine or press: in this step a motor 8, M is switched on which, by rotating the pump 4, P1, starts to make the oil circulate in the circuit.

[0023] The oil flows through a first valve 9, V5, which is a one-way valve for protecting the pump 4, P1; it is a one-way valve that prevents the flow of the oil toward the pump 4, P1 whereas it allows its flow toward the user device.

[0024] In this condition, the circuit is not pressurized, because the fluid is discharged through a first electric valve 10, V1 that is in the inactive position.

[0025] The first electric valve 10, V1 in the inactive position discharges the circuit onto the tank 11, whereas in the position V1A it prevents the passage of the oil toward the tank 11, i.e., it acts as a plug.

[0026] In order to pressurize the circuit, all the drains to the tank 11 must be closed, and therefore the first electric valve 10, V1 is energized and reaches the position V1A and, if there is a safety block 12 for accumulators 5, ACC, as shown in Figure 2, a second electric valve 13, V2 also is energized which in turn reaches the position V2A.

[0027] The proportional direction valve 6, V8 is in the inactive position with the centers closed, i.e., with P, T, A and B plugged; the oil cannot pass through it and therefore the part of the circuit that is upstream thereof is pressurized.

[0028] In the configuration of the preceding case, one achieves also the loading of the accumulator 5, ACC, since the first valve 9, V5 and a second valve 14, V5 and a third electric valve 15, V3, the first two being simple one-way valves and the last one being a one-way valve in the inactive position, prevent the flow of the oil only downward; therefore, once the circuit is pressurized the accumulator 5, ACC begins to load.

[0029] When a pressure transducer 16, T1 sends the signal that the reference pressure (target) has been reached, the first electric valve 10, V1 is deactivated and the oil resumes flowing through it from the pump 4, P to the tank 11.

[0030] Due to the configuration of the third electric valve 15, V3, which is inactive, the accumulator 5, ACC remains pressurized.

[0031] Once the preparatory step for the power-on of the machine or press has ended, the bending cycle can begin; initially there is a quick descent of the upper beam 2 and then the step of approach to the metal plate to be bent (not shown) at the working speed begins.

[0032] Shortly before the metal plate to be bent interacts with the lower beam 3, the pump 4, P1 is inserted in the circuit again by activation of the first electric valve 10, V1, moving it to the position V1A.

[0033] One reaches a situation of equilibrium as regards the pressures, between the branches upstream and downstream of the third electric valve 15, V3, which therefore can be in the position V3A so that the oil of the accumulator 5, ACC can flow in the circuit; as long as this situation of pressure balance persists, nothing happens.

[0034] Upstream of the proportional direction valve 6, V8, which continues to remain inactive, the circuit is pressurized and the accumulator 5, ACC is inserted.

[0035] The bending step begins and therefore following, deformation and cambering in position occur.

[0036] The main cylinders 17a, 17b of the press push downward in order to reach the levels YY1 and YY2 that will allow reaching the target angle of the plate being bent.

[0037] As this step proceeds, the upper beam 2 is deformed; the numeric control or computer 18, CNC begins comparing the values of the deformation of the upper beam 2 with those of the lower beam 3, measured respectively by adapted position transducers 19, UT and 20, LT, and operates accordingly; its purpose is to render the deflection of the lower beam 3 equal to the deflection of the upper beam 2.

[0038] To achieve this, the cambering jacks 17a, 17b must be opened more or less according to need; the 'more or less' is obtained by operating on the proportional direction valve 6, V8, moving its slider continuously and proportionally to the supply current of the coils between the positions V8A and V8B.

[0039] By moving toward the position V8A, the oil flows toward the cambering jacks 17a, 17b, pressurizing them and opening them.

[0040] By moving toward the position V8B, the cambering is depressurized and consequently the deformation of the lower central beam 3 is reduced.

[0041] The numeric control or computer 18, CNC operates therefore in the following manner: if the level QUT detected by the transducer 19, UT on the upper beam 2 is higher than the level QLT detected by the transducer 20, LT on the lower beam 3, the slider of the proportional direction valve 6, V8 is induced to move toward the position V8A and the deformation of the lower beam 3 is increased.

[0042] If instead QUT<QLT, the slider of the proportional direction valve 6, V8 is caused to move toward the position V8B and the deformation of the lower beam 3 is decreased.

[0043] If QUT = QLT, the slider of the proportional direction valve 6, V8 is caused to move toward the inactive position and the deformation of the lower beam 3 is kept constant.

[0044] All this occurs in a continuous and dynamic manner; as the two deflections mutually approach, the proportional direction valve 6, V8 approaches the central closure position; as the demand for oil decreases, the excess oil reloads the accumulator 5, ACC.

[0045] Once the main cylinders 17a, 17b of the machine or press have reached the target levels YY1 and YY2 and the values of the deflections of the two beams, the lower one 3 and the upper one 2, are identical, this means that the part has been bent, and therefore the relaxation step begins, in which the pressure in the main cylinders 17a, 17b is decreased and the structure relaxes.

[0046] The upper beam 2 returns to the horizontal and therefore, since cambering is still active, the lower beam 3, which continues to follow its deflection, also returns to the horizontal, discharging the excess oil from the cambering jacks 7.

[0047] Once the relaxation step has finished, with the upper beam 2 and the lower beam 3 by now perfectly horizontal, the proportional direction valve 6, V8 is returned to the inactive position and one is ready to restart with a new bending cycle by reloading the accumulators 5, ACC if necessary.

[0048] It is noted that in circuits with accumulators 5, ACC of a capacity greater than one liter, and therefore with a safety block 12 certified according to the mandatory standards of the country of destination, once the machine or press has been powered on, the second electric valve 13, V2 remains always active (discharge closed) so that the oil cannot be discharged into the tank 11; it can be deactivated at the end of the day.

[0049] The maximum pressure in the circuit is determined first by the third safety valve 21, V4 and then by the fourth safety valve 22, V7 and the fifth safety valve 23, V9.

[0050] The pressure of the accumulator 5, ACC never drops below the minimum value necessary for cambering.

[0051] The proportional direction valve 6, V8 does not determine the pressure of the circuit, but merely passes either toward the cambering or toward the discharge quantities of oil that are proportional to the current that flows through the coils that move its slider.

[0052] The first electric valve 10, V1 and the third electric valve 15, V3 are fundamentally on/off - open/closed valves; the third electric valve 15, V3 actually always lets the oil flow 'upward from below', whereas it behaves as on-off only downward from above.

[0053] It is possible to provide for the use of multiple accumulators 5, ACC with a capacity of less than one liter which are mutually connected.

[0054] In practice it has been found that the invention fully achieves the intended aim and objects cited above, more energy being saved than in the illustrated background art; the device allows moving small volumes of oil, but when it intervenes these volumes are supplied in very short times; there are, therefore, high flow-rates of oil and therefore many liters/minute.

[0055] The use of the accumulator allows using a pump having a small capacity, despite supplying, in the set pressure range, high immediate flow-rates of oil.

[0056] It is noted, moreover, that the device allows having the quantity of oil necessary only when it is needed, without draining it uselessly.

[0057] Therefore, higher energy savings are achieved thanks to the use of the proportional direction valve 6, V8: in the background art the deformation of the jacks was controlled by a proportional pressure valve that operated this control, acting on the pressure of the circuit, but in order to do this large quantities of oil were drained and therefore large amounts of energy were 'wasted' uselessly.

[0058] The device allows instead a position control by means of a proportional direction valve and therefore one drains and then produces the laminar flow of a quantity of oil that is positively lower than before, thus saving more energy.

[0059] There is, moreover, a lower installed power: the main purpose of the pump 4, P1 is to charge the accumulator 5, ACC during idle times, whereas the supply of the cambering jacks 7 is provided almost exclusively by the latter.

[0060] It is possible therefore to install a pump 4, P1 with a lower capacity than that of a circuit of the known type without accumulator.

[0061] Finally, there is a higher speed of reaction of the cambering, due to the greater instantaneous flow supplied by the accumulator 5, ACC and the use of the proportional direction valve 6, V8 with respect to the traditional circuit of the known type, where the function of supplying power to the cambering was performed by a larger pump and a proportional pressure valve was used.

[0062] With the device, the cycle time is reduced and productivity increases.

[0063] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent to the specific requirements.

[0064] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including embodiments that are not illustrated.

[0065] The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0066] The disclosures in Italian Patent Application No.

TV2012A000125 from which this application claims priority are incorporated herein by reference.

[0067] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An active cambering device (1) of bending presses comprising an upper beam (2) and a lower beam (3), **characterized in that** it comprises a pump (4, P1) adapted to load at least one accumulator (5, ACC), said accumulator (5, ACC) being adapted to actuate said lower beam (3) by means of a proportional direction valve (6, V8).

2. The device according to claim 1, **characterized in that** said proportional direction valve (6, V8) has a positioning of the slider that is continuous and proportional to the current that flows through the coils/solenoids installed therein, said proportional direction valve (6, V8) having three possible positions, between which said slider can move, affecting them both partially and completely: a first inactive position with closed centers, in which there is no connection between the various branches P (pressurized branch), T (discharge), A (use) and B (use) which arrive at/exit from said proportional direction valve (6, V8), which behaves like a plug, preventing the passage of the oil in any direction; a second position V8A with crossed centers, in which said branch P is connected to said branch B so that in this condition the oil flows toward the cambering jacks (7) of said lower beam (3) and said branch T is also connected to said branch A, which is plugged; a third position V8B with said centers straight, so as to connect said branch P to said plugged branch A, and said branch T to said branch B so as to discharge the oil that arrives form said cambering jacks (7).

3. A method for active cambering of bending presses comprising an upper beam (2) and a lower beam (3), **characterized in that** once all the drains to a tank (11) are closed, in order to pressurize the circuit a first electric valve (10, V1) is energized and reaches the position V1A and, if a safety block (12) for at least one accumulator (5, ACC) is provided, a second electric valve (13, V2) also is energized and in turn reaches the position V2A, a proportional direction valve (6, V8) being provided in the inactive position with the branches (P, T, A, B) closed, allowing pressurization of the part of the circuit that is upstream thereof, achieving also the loading of said at least one accumulator (5, ACC) since a first valve (9, V5) and a second valve (14, V5) and a third electric valve (15, V3), the first two being simple one-way valves and the last one being a check valve in the inactive position, prevent the flow of the oil only downward, so that once the circuit is pressurized said at least one accumulator (5, ACC) begins to load.

4. The method according to claim 3, **characterized in that** when a pressure transducer (16, T1) sends the signal that the reference pressure (target) has been reached, said first electric valve (10, V1) is deactivated and the oil resumes flowing through it from a pump (4, P) to said tank (11), the configuration of said third electric valve (15, V3) when inactive allowing said at least one accumulator (5, ACC) to remain pressurized.

5. The method according to claim 3, wherein, once the preparatory step for the power-on of said bending press has ended, the bending cycle begins with an initial quick descent of said upper beam (2) and then a step of approach to the metal plate to be bent at the working speed, **characterized in that** shortly before said metal plate to be bent interacts with said lower beam (3), said pump (4, P1) is inserted in the circuit again by activating said first electric valve (10, V1), moving it to the position V1A so that a situation of equilibrium is reached as regards pressures between the branches upstream and downstream of said third electric valve (15, V3), which therefore can be in the position V3A so that the oil that is present in said at least one accumulator (5, ACC) can flow in the circuit.

6. The method according to one or more of claims 3 to 5, **characterized in that** at the beginning of the bending step main cylinders (17a, 17b) of said upper beam (2) press downward in order to reach preset heights YY1 and YY2 which are adapted to allow reaching the target angle of the plate being bent as this step progresses, said upper beam (2) being deformed while a numeric control or computer (18, CNC) begins to compare the values of the deformation of said upper beam (2) with those of said lower beam (3), measured respectively by adapted position transducers (19, UT; 20, LT) in this step opening partially or fully said cambering jacks (17a, 17b) by acting on said proportional direction valve (6, V8), moving its slider continuously and proportionally to the supply current of the coils, between the positions V8A and V8B so that the deflection of said lower beam (3) matches the deflection of said upper beam (2).

7. The method according to one or more of claims 3 to 6, **characterized in that** by moving toward said position V8A the oil flows toward said cambering jacks

(17a, 17b), pressurizing them and opening them, whereas by moving toward said position V8B the cambering is depressurized and consequently the deformation of said lower beam (3) is reduced, said numeric control or computer (18, CNC) operating so that if the level (QOT) detected by said transducer (19, UT) on said upper beam (2) is higher than the level (QLT) detected by said transducer (20, LT) on said lower beam (3), the slider of said proportional direction valve (6, V() is caused to move toward said position V8A and the deformation of said lower beam (3) is increased; if instead QUT < QLT the slider of said proportional direction valve (6, V8) is caused to move toward said position V8B and the deformation of said lower beam (3) is decreased; if QUT = QLT the slider of said proportional direction valve (6, V8) is caused to move toward the inactive position and the deformation of said lower beam (3) is kept constant.

8. The method according to one or more of claims 3 to 7, **characterized in that** as the two deflections mutually approach, said proportional direction valve (6, V8) approaches the central closure position, whereas as the demand for oil decreases, the excess oil reloads said at least one accumulator (5, ACC).

9. The method according to one or more of claims 3 to 8, **characterized in that** once said main cylinders (17a, 17b) of said bending press have reached said levels YY1 and YY2 and the values of the deflections of said two beams, the lower one (3) and the upper one (2), are identical, the part has been bent and the relaxation step begins, in said step the pressure in said main cylinders (17a, 17b) being decreased and said upper beam (2) and said lower beam (3) returning to the horizontal, discharging the excess oil from said cambering jacks (7).

10. The method according to one or more of claims 3 to 9, **characterized in that** the maximum pressure in the circuit is determined by a fourth safety valve (21, V4), by a fifth valve (22, V7) and by a sixth safety valve (23, V9), said proportional direction valve (6, V8) merely passing either toward the cambering or toward the discharge quantities of oil that are proportional to the current that flows through the coils that move the slider thereof.

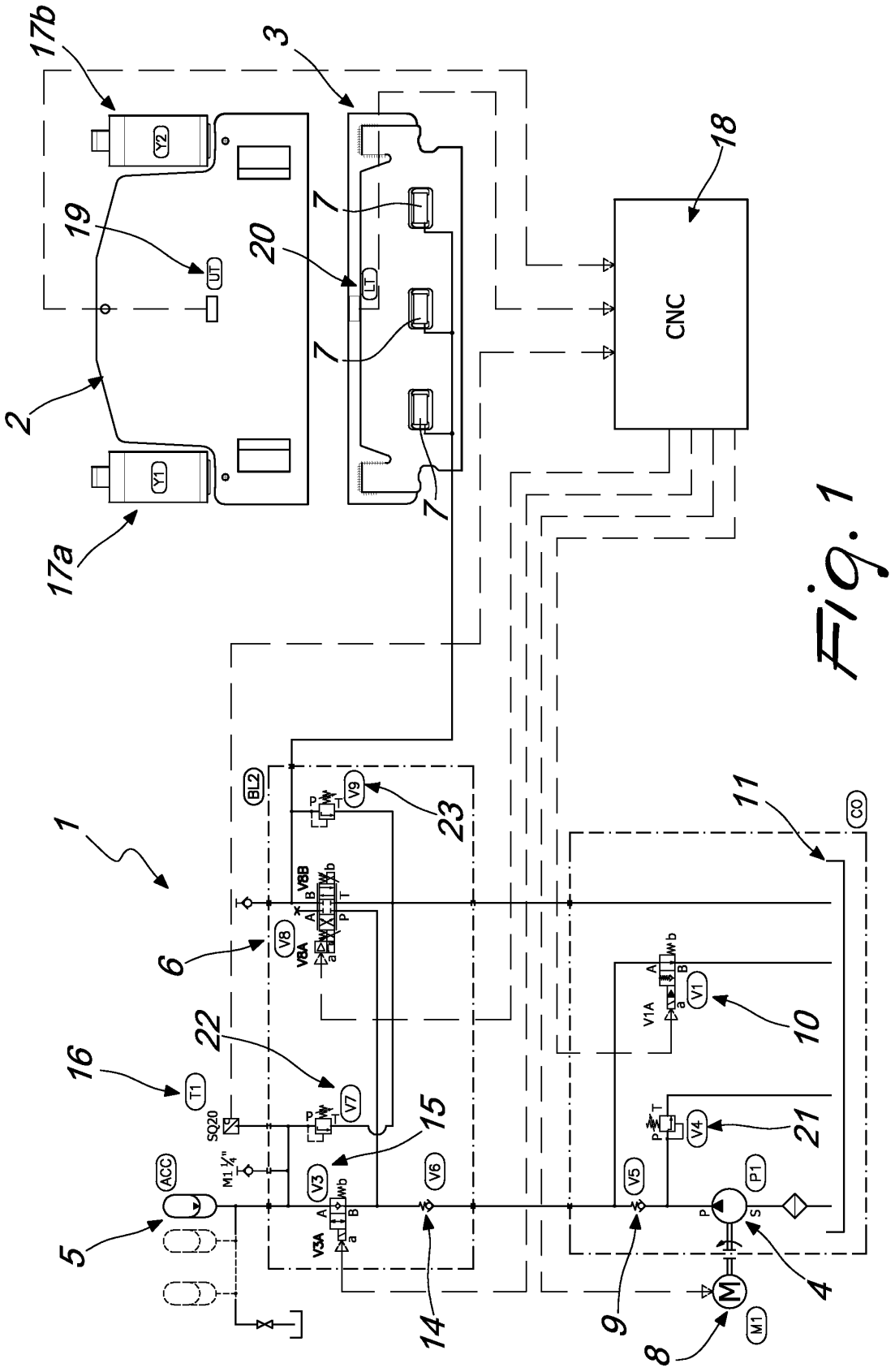
17b
3
18
19
20
7
2
CNC
UT
LT
Y2
Y1
17a
1
BL2
V9
23
V8B
V8A
V8
6
11
CO
V1A
V1
10
22
16
T1
SQ20
V7
15
V4
21
ACC
M1 1/4"
V3
V3A
V6
V5
P1
5
14
9
4
8
M1

Fig. 1

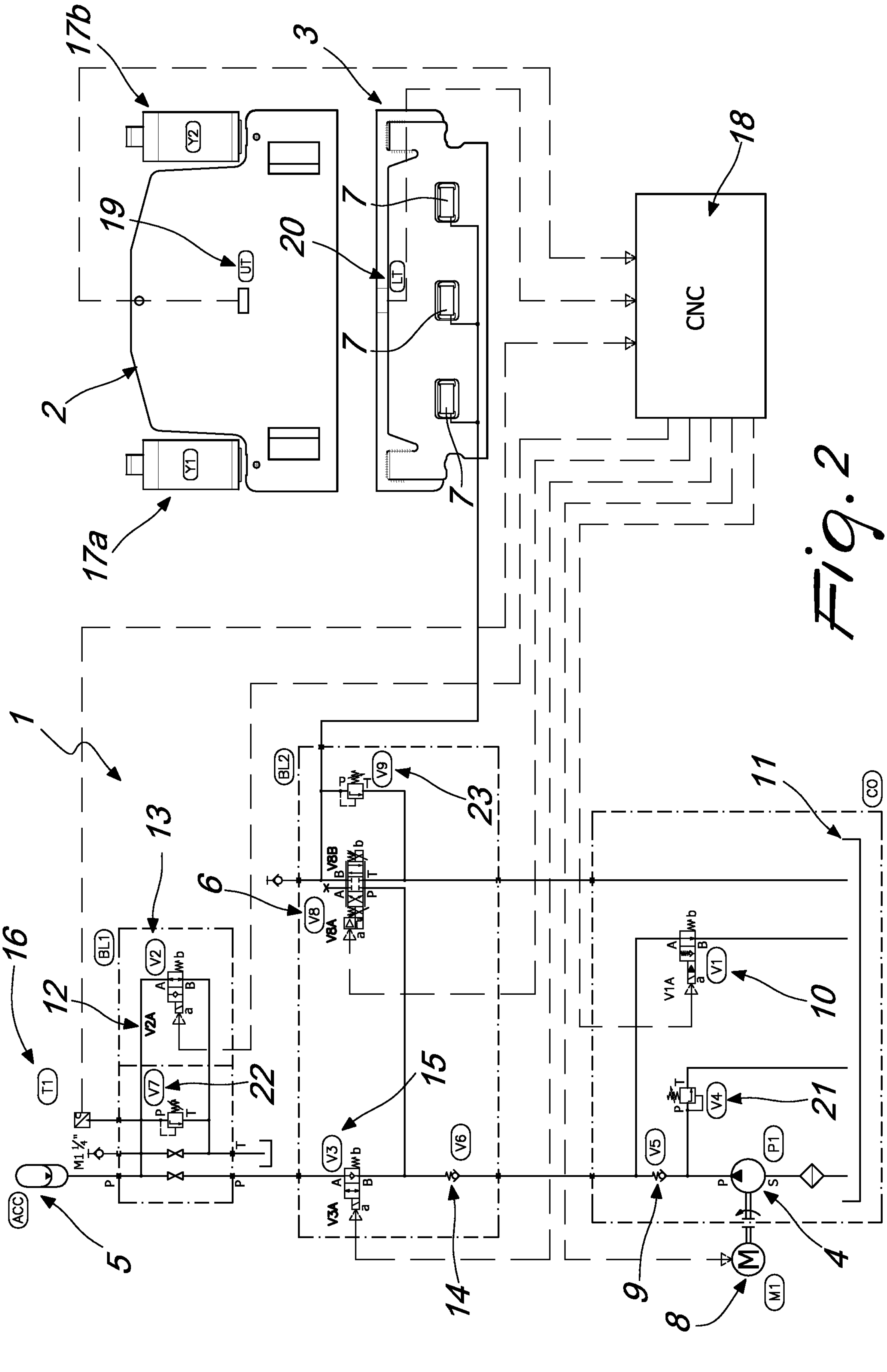
CNC
Y1
Y2
UT
LT
ACC
T1
BL1
BL2
CO
V1
V2
V3
V4
V5
V6
V7
V8
V9
V1A
V2A
V3A
V8A
V8B
P1
M1
M1 ¼"
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17a
17b
18
19
20
21
22
23

Fig. 2

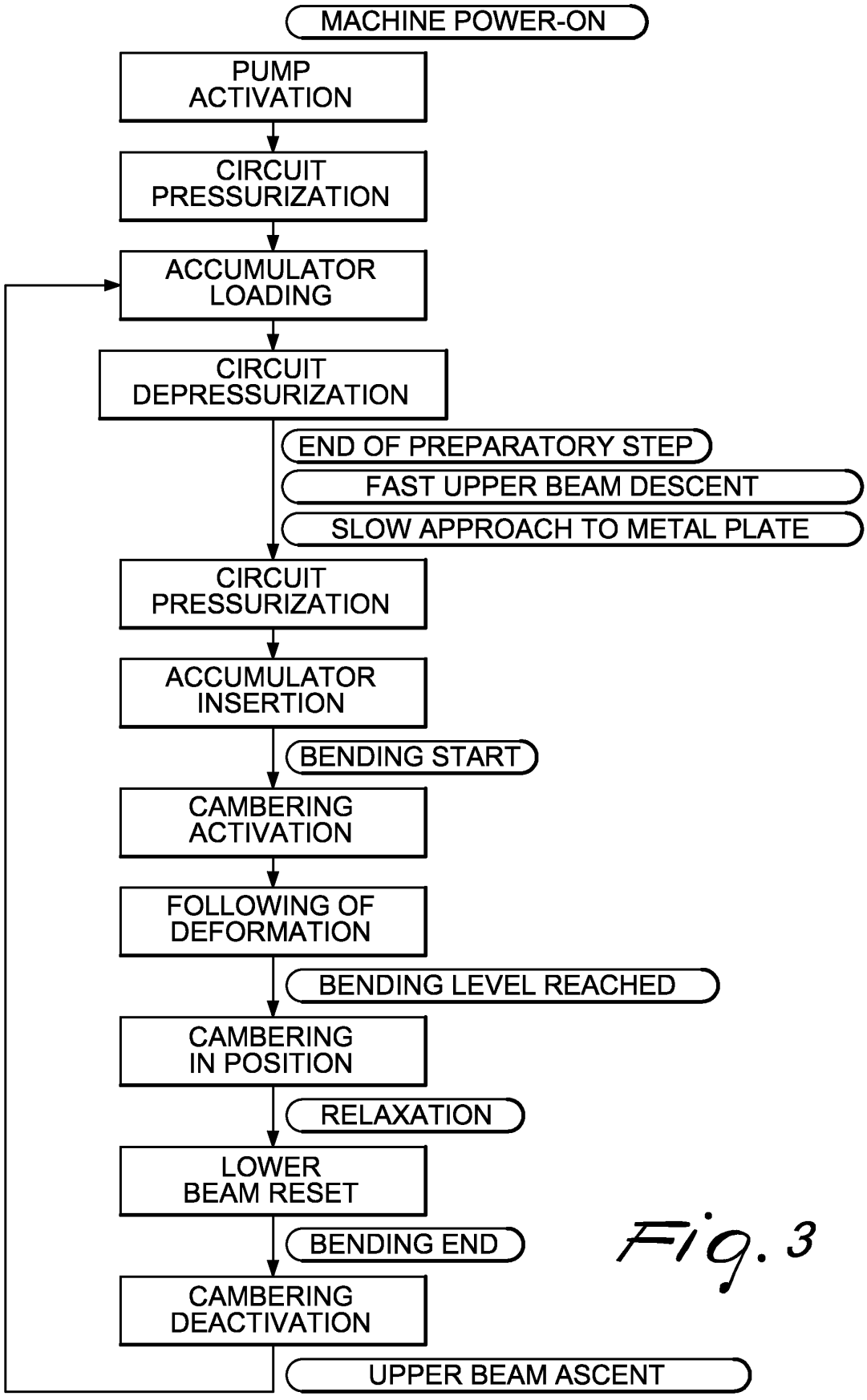
MACHINE POWER-ON
PUMP ACTIVATION
CIRCUIT PRESSURIZATION
ACCUMULATOR LOADING
CIRCUIT DEPRESSURIZATION
END OF PREPARATORY STEP
FAST UPPER BEAM DESCENT
SLOW APPROACH TO METAL PLATE
CIRCUIT PRESSURIZATION
ACCUMULATOR INSERTION
BENDING START
CAMBERING ACTIVATION
FOLLOWING OF DEFORMATION
BENDING LEVEL REACHED
CAMBERING IN POSITION
RELAXATION
LOWER BEAM RESET
BENDING END
CAMBERING DEACTIVATION
UPPER BEAM ASCENT

Fig. 3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 13 16 3686

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 914 975 A (KAWANO SUSUMU) 28 October 1975 (1975-10-28) * column 1, line 58 - column 2, line 36; figures * -----	1,3	INV. B21D5/02 B30B15/00
A	US 2007/033981 A1 (GERRITSEN GERRIT [CH] ET AL) 15 February 2007 (2007-02-15) * paragraph [0038]; figure 1 * -----	1,3	
A	WO 2008/049796 A1 (TASK 84 S P A [IT]; BANFI ANTONIO MARIA [IT]) 2 May 2008 (2008-05-02) * page 8, line 26 - page 9, line 26; claim 1; figures 1-3 * -----	1,3	

TECHNICAL FIELDS SEARCHED (IPC)

B21D
B30B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 September 2013	Pieracci, Andrea

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 16 3686

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-09-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3914975 A	28-10-1975	NONE	
US 2007033981 A1	15-02-2007	AT 427830 T	15-04-2009
		CA 2516998 A1	10-09-2004
		CN 1767940 A	03-05-2006
		EP 1452302 A1	01-09-2004
		US 2007033981 A1	15-02-2007
		WO 2004076161 A1	10-09-2004
WO 2008049796 A1	02-05-2008	NONE	

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT TV20120125 A **[0066]**