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(71) Applicant: **CYBORGLINE SA**
6902 Paradiso - Lugano (CH)

(72) Inventor: **VEZZANI, Giuseppe**
6900 Paradiso - Lugano (CH)

(74) Representative: **Mittler, Andrea et al**
MITTLER & C. s.r.l.
Viale Lombardia, 20
20131 Milano (IT)

(54) **DOSING MACHINE OF LONG PASTA, WITH DOUBLE LOADING AND SINGLE DISCHARGE**

(57) A dosing machine (1) of long pasta is described comprising two loading and dosing channels (100) able to converge into a single compartment (59) under which a conveying trough is placed suitable for guiding the doses of long pasta in subsequent packaging phases. Each loading and dosing channel (100) comprises a descender (2), a rotor (3) suitable for pouring doses of long pasta into a roughing basket (4) and weighing devices (5) suitable for weighing the long pasta in the roughing basket (4) and in a finishing basket (6) placed downstream of the roughing basket (4). Each loading and dosing channel (100) further comprises a distribution basket (12) placed downstream of the finishing basket (6), wherein the distribution basket (12) has an external movable wall (121) and an internal movable wall (122) which are independently operable.

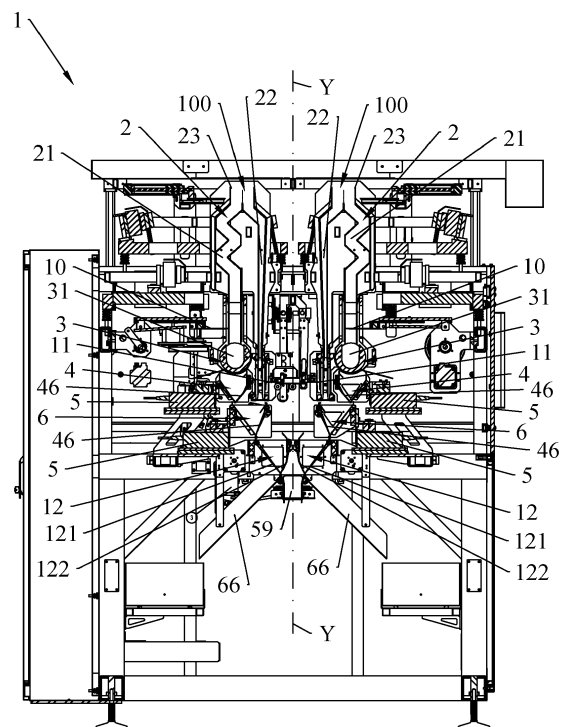


FIG.3

Description

[0001] The present invention concerns a dosing machine of long pasta, with double loading and single discharge

[0002] Dosing machines of long pasta placed after a production line of long pasta, following a conveyor adapted to direct the pasta therein to be dosed and discharged into a packaging machine, are known.

[0003] Prior to being packaged, the long pasta has to be suitably weighed so as to establish and control the amount provided for the packaging.

[0004] Dosing machines generally provide a descender provided with roughing and finishing channels, a dosing rotor with at least one compartment, one or more collection baskets and weight meters.

[0005] To increase production, dosing machines have been made with a double loading and dosing channel for the long pasta, wherein each loading and dosing channel comprises a descender provided with a roughing channel and a finishing channel, a dosing rotor with at least one compartment, one or more collection baskets and weight meters.

[0006] An example of a dosing machine with a double loading and dosing channel is described in EP-3142927 by the present applicant, wherein the rotors have three compartments for dosing the long pasta into respective baskets where the first weighing takes place.

[0007] Following said first weighing the long pasta falls into a first and second additional baskets.

[0008] Below each additional basket a drawer is arranged sliding horizontally and adapted to assume a first position below the respective additional basket and a second position in which the opening of a sliding base of the drawer enables the pasta to fall into a compartment which guides the desired dose of pasta into a conveying trough below.

[0009] A conveying trough, also known as a supply trough, means a channel provided with means adapted to move the dose of pasta, e.g., a conveyor belt or thrust paddles which move the pasta along a sliding plane. The conveying trough enables the dose of pasta to be moved in a defined direction.

[0010] In said first position, if the dose of pasta is of an undesired quantity, the pasta can fall into respective waste channels.

[0011] Disadvantageously, the continuous horizontal movement of a pair of drawers is necessary to perform the function of an intermediate means for loading the pasta from two loading units and discharging into a single conveying trough through a single compartment.

[0012] The continuous horizontal movement of the drawers is arduous for the drawers themselves, and slows down the discharge into the individual compartment, actually limiting the speed of the double dose through distinct descenders, rotors and baskets.

[0013] The object of the present invention is to provide a dosing machine of long pasta provided with two de-

scenders and two dosing rotors for a single conveying trough, wherein the loading into the conveying trough takes place without slowing down the dosing rotors.

[0014] A further object of the present invention is that the dosing machine has means for loading into the conveying trough which are simple to assemble and control.

[0015] Yet another object of the present invention is that said loading means are durable over time with little maintenance.

[0016] According to the invention, said and further objects are achieved with a dosing machine of long pasta able to be placed after a production line of the long pasta, following a conveyor able to direct the long pasta inside the dosing machine, so that the long pasta is dosed and discharged into a packaging machine, comprising two loading and dosing channels able to converge into a single compartment under which there is a conveying trough suitable for guiding the doses of long pasta in subsequent packaging phases,

wherein each loading and dosing channel comprises a descender, a rotor suitable for pouring doses of long pasta into a roughing basket, and weighing devices suitable for weighing the long pasta in the roughing basket and in a finishing basket placed downstream of the roughing basket,

wherein the descender comprises a roughing channel and a finishing channel, wherein the roughing basket and the finishing basket have a movable wall able to assume a closed position in which the dose of long pasta is retained in the roughing basket or in the finishing basket, and an open position in which the dose of long pasta can go below the roughing basket or the finishing basket, characterized in that

each loading and dosing channel also comprises a distribution basket placed downstream of the finishing basket,

wherein the distribution basket has an external movable wall and an internal movable wall which are independently operable,

the external movable wall and the internal movable wall being both able to assume a closed position and an open position, wherein if both the movable walls of the distribution basket are in closed position the dose of long pasta is retained in the distribution basket, while in the case in which only the external movable wall of the distribution basket is in the open position the long pasta is able to descend into a waste channel, and alternatively, in the case in which only the internal movable wall of the distribution basket is in the open position the long pasta is able to descend into the single compartment.

[0017] Advantageously, the movable walls of the distribution basket reduce the mechanical discharge movements and allow speeding up as the weight of the movable walls is greatly reduced with respect to known hor-

izontally sliding drawers.

[0018] Consequently, the speed of the movement means for the conveying trough below the individual compartment can increase with a considerable increase in production per time unit.

[0019] Advantageously, the lower part of the dosing machine in which the distribution baskets are mounted is easily accessible being immediately above the individual compartment.

[0020] These and other features of the present invention will become more apparent from the following detailed description in practical embodiments thereof illustrated by way of non-limiting example in the accompanying drawings, in which:

Figure 1 shows a perspective view of a machine according to the present invention;

Figure 2 shows a side view of the machine;

Figure 3 shows a cross-section view taken along the line III-III of Figure 2.

[0021] A dosing machine 1 of long pasta, e.g. spaghetti, able to be placed after a production line of the long pasta, following a conveyor (e.g. a bucket conveyor) able to direct the long pasta inside the dosing machine 1 to be dosed and discharged into a packaging machine, comprises two loading and dosing channels 100 able to converge into a single compartment 59 under which a conveying trough (not shown in the figures) is placed suitable for guiding the doses of long pasta in subsequent packaging phases.

[0022] A conveying trough, also known as a supply trough, means a channel provided with means adapted to move the dose of pasta, e.g., a conveyor belt or thrust paddles that move the pasta along a sliding plane. The conveying trough enables the dose of pasta to be moved in a defined direction.

[0023] As shown in Figure 3, each loading and dosing channel 100 comprises a descender 2, preferably of the vibrating type, a rotor 3 suitable for pouring doses of long pasta into a roughing basket 4 and weighing devices 5 suitable for weighing the long pasta in the roughing basket 4 and in a finishing basket 6 placed downstream of the roughing basket 4.

[0024] Each loading and dosing channel 100 also comprises a distribution basket 12 placed downstream of the finishing basket 6.

[0025] The descender 2 comprises a roughing channel 21 and a finishing channel 22.

[0026] The rotor 3, placed downstream of the roughing channel 21, is provided with a single loop 31 able to contain a dose of long pasta defined by a shutter 10 (preferably a paddle shutter) adapted to selectively obstruct the roughing channel 21 upstream of the rotor 3. The rotor 3 may have a higher number of loops, e.g., three loops, so as to split the dose.

[0027] A shutter 11 adapted to selectively obstruct the finishing channel 22 is placed close to the lower end of

the finishing channel 22.

[0028] The roughing basket 4 and the finishing basket 6 have a movable wall 46 able to assume a closed position in which the dose of long pasta is retained in the basket, and an open position in which the dose of long pasta can go below the roughing basket 4 or finishing basket 6.

[0029] The distribution basket 12 has a double movable wall, in particular an external movable wall 121 and an internal movable wall 122 which are independently operable.

[0030] The external movable wall 121 and the internal movable wall 122 are both able to assume a closed position and an open position.

[0031] If both the movable walls 121, 122 are in the closed position, the dose of long pasta is retained in the distribution basket 12.

[0032] If only the external movable wall 121 is in the open position, the long pasta is able to descend into a waste channel 66.

[0033] Alternatively, if only the internal movable wall 122 is in the open position, the long pasta is able to descend into the individual compartment 59.

[0034] The movable walls 46 of the roughing basket 4 and of the finishing basket 6 are inner walls so as to make the long pasta descend towards the center of the dosing machine 1 where the individual compartment 59 is located.

[0035] Observing Figure 3, it can be noted that the loading and dosing channels 100 are mirrored with respect to a central axis Y which substantially vertically cuts the single compartment 59 in half.

[0036] Up to the rotors 3 the long pasta substantially drops parallel along the two loading and dosing channels 100. In the passage between the roughing basket 4 and the distribution basket 12 the long pasta converges towards the central axis Y.

[0037] With reference to the baskets 4, 6, 12, an inner wall means a wall placed towards the central axis Y, i.e., that opens moving towards said central axis Y.

[0038] The external movable wall 121 has a preferably flat internal surface, while the internal movable wall 122 preferably has a double internal flat surface with a central connection so as to define a concavity inside the distribution basket 12.

[0039] Said double internal surface enables the long pasta to be directed with greater precision into the compartment 59 with a lower risk of the long pasta breaking as it descends sliding on or next to a vertical wall of the compartment 59. The opening of the internal movable wall 122 of each distribution basket 12 enables the sliding of the long pasta on or next to opposing vertical side walls of the compartment 59. Advantageously, in the event of simultaneous opening of the internal movable walls 122 of the two distribution baskets 12 for discharging a larger quantity of pasta into the conveying trough below, the long pasta falling from the two distribution baskets 12 does not crash thus avoiding unwanted breakages of the

long pasta.

[0040] Operatively, long pasta is introduced in the descenders 2 through mouths 23.

[0041] In each loading and dosing channel 100, the long pasta descends in part into the roughing channel 21 and in part into the finishing channel 22. The shutter 10 obstructs the roughing channel 21 so that a predefined dose of long pasta is accumulated, which is poured into the cavity 31 of the rotor 3 and then into the roughing basket 4, in which a weighing control takes place: if the long pasta is not sufficient, the shutter 11 frees the descent of the long pasta into the finishing channel 22 so that the missing long pasta accumulates in the finishing basket 6. In the subsequent distribution basket 12 a final weighing control takes place before the long pasta leaves the loading and dosing channel 100 towards the compartment 59 or the waste channel 66.

[0042] More in particular, if the final weighing is satisfactory a control unit of the dosing machine 1 controls the opening of the internal movable wall 122; vice versa, the control unit controls the opening of the external movable wall 121.

[0043] The control unit is also able to synchronize the alternating opening of the external movable walls 121 and of the internal movable walls 122 of the two distribution baskets 12 so as to optimize the discharge into the compartment 59 and consequently into the conveying trough below.

[0044] Normally, the opening of the internal movable walls 122 is alternated, but the control unit is also able to open them simultaneously to increase the quantity of long pasta falling into the individual compartment 59.

[0045] Advantageously, the movable walls 121, 122 of the distribution basket 12 reduce the mechanical discharge movements and allow speeding up as the weight of the movable walls 121, 122 is greatly reduced with respect to known horizontally sliding drawers.

[0046] Consequently, the speed of the movement means for the conveying trough below the individual compartment 59 can increase with a considerable increase in production in the time unit.

[0047] The movable walls 121, 122 are substantially simple doors which in the closed position support the long pasta and in the open position enable it to descend.

[0048] The movable walls 121, 122 have an easily operable rotation pivot and the opening movement depends on the weight of the falling long pasta.

[0049] Advantageously, the lower part of the dosing machine 1 in which the distribution baskets 12 are mounted is easily accessible being immediately above the individual compartment 59, i.e., above an empty space in which the conveying trough is arranged which is structurally independent from the dosing machine 1.

Claims

1. Dosing machine (1) of long pasta able to be placed

after a production line of the long pasta, following a conveyor able to direct the long pasta inside the dosing machine (1), so that the long pasta is dosed and discharged into a packaging machine, comprising two loading and dosing channels (100) able to converge into a single compartment (59) under which there is a conveying trough suitable for guiding the doses of long pasta in subsequent packaging phases,

wherein each loading and dosing channel (100) comprises a descender (2), a rotor (3) suitable for pouring doses of long pasta into a roughing basket (4), and weighing devices (5) suitable for weighing the long pasta in the roughing basket (4) and in a finishing basket (6) placed downstream of the roughing basket (4),

wherein the descender (2) comprises a roughing channel (21) and a finishing channel (22),

wherein the roughing basket (4) and the finishing basket (6) have a movable wall (46) able to assume a closed position in which the dose of long pasta is retained in the roughing basket (4) or in the finishing basket (6), and an open position in which the dose of long pasta can go below the roughing basket (4) or the finishing basket (6),

characterized in that

each loading and dosing channel (100) also comprises a distribution basket (12) placed downstream of the finishing basket (6),

wherein the distribution basket (12) has an external movable wall (121) and an internal movable wall (122) which are independently operable,

the external movable wall (121) and the internal movable wall (122) being both able to assume a closed position and an open position, wherein if both the movable walls (121, 122) of the distribution basket (12) are in closed position the dose of long pasta is retained in the distribution basket (12), while in the case in which only the external movable wall (121) of the distribution basket (12) is in the open position the long pasta is able to descend into a waste channel (66), and alternatively, in the case in which only the internal movable wall (122) of the distribution basket (12) is in the open position the long pasta is able to descend into the single compartment (59).

2. Dosing machine (1) according to claim 1, **characterized in that** the external movable wall (121) of the distribution basket (12) has a flat internal surface, while the internal movable wall (122) of the distribution basket (12) has a double internal flat surface with a central connection so as to define a concavity inside the distribution basket (12).

3. Dosing machine (1) according to claim 1 or 2, **characterized in that** it comprises a control unit able to synchronize the opening of the movable walls (121, 122) of the two distribution baskets (12).

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4. Dosing machine (1) according to any one of the preceding claims, **characterized in that** the loading and dosing channels (100) are mirrored with respect to a central axis (Y) which vertically cuts the single compartment (59) in half.

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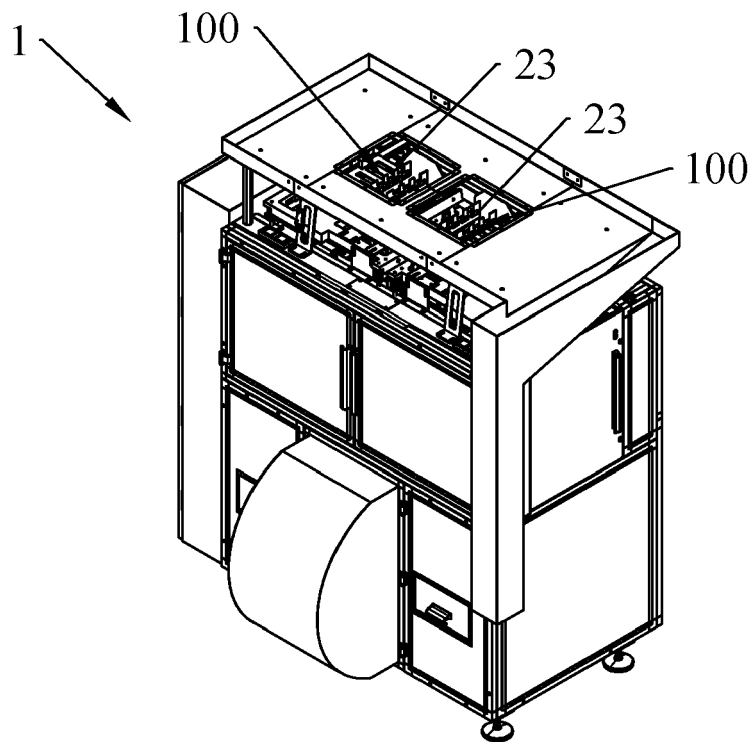


FIG.1

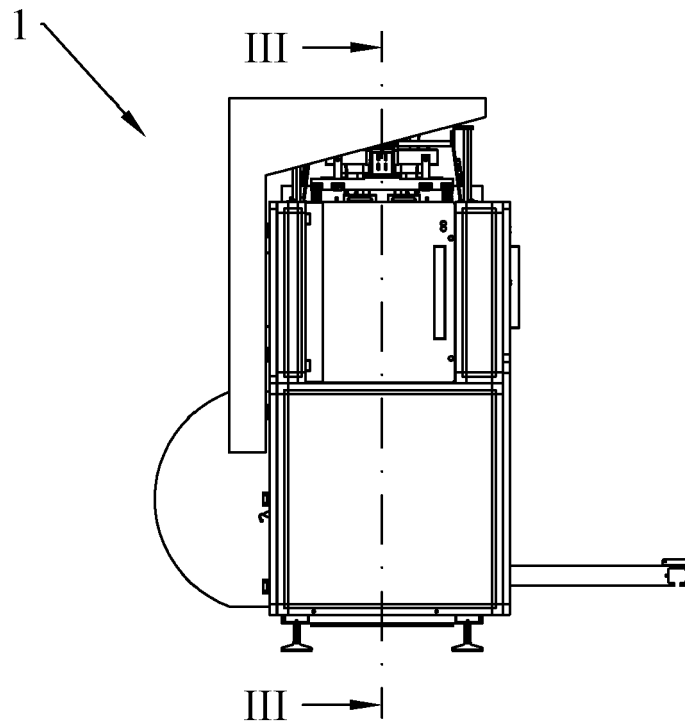


FIG.2

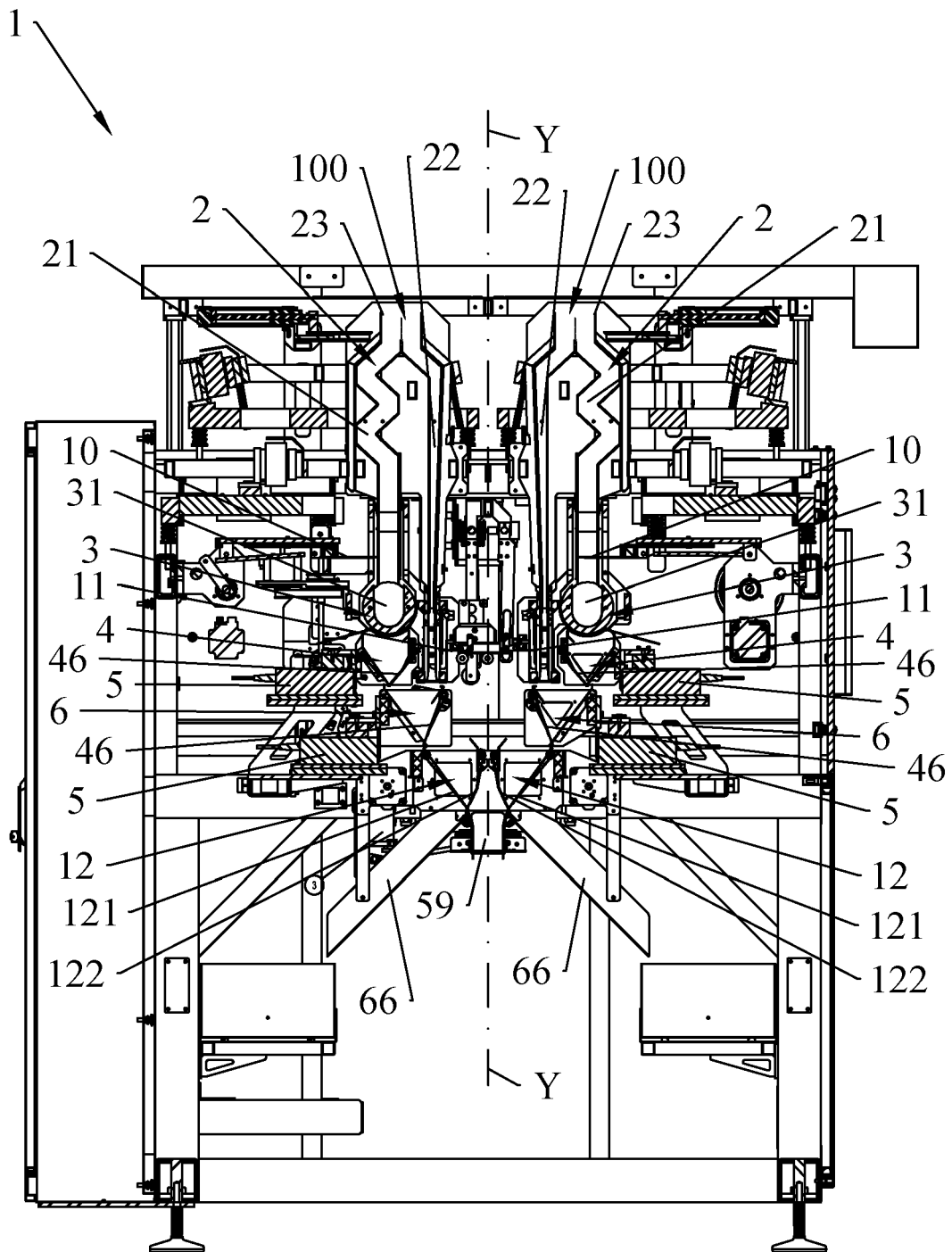


FIG.3



EUROPEAN SEARCH REPORT

Application Number

EP 23 15 4958

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, D	EP 3 142 927 A1 (VEZZANI GIUSEPPE [CH]) 22 March 2017 (2017-03-22) * abstract * * figures 14-15 * * figures 7-8 *	1-4	INV. B65B1/32 B65B1/36 B65B19/34 B65B37/02 B65B37/08
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
Place of search		Date of completion of the search	Examiner
Munich		5 July 2023	Damiani, Alberto
CATEGORY OF CITED DOCUMENTS		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	
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 23 15 4958

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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05-07-2023

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