



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.02.2005 Bulletin 2005/05

(51) Int Cl.7: **B65H 39/00**

(21) Application number: **04017625.7**

(22) Date of filing: **26.07.2004**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL HR LT LV MK

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(30) Priority: **25.07.2003 DE 10334099**

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(54) **Document compiling apparatus**

(57) In an enclosure-collating path on which enclosure compartments are defined by conveying fingers (5,6), a displacement of enclosures during deceleration phases of the driven conveying fingers and thus incorrect positioning of enclosures at ejecting stations or an inserter station is prevented in that the enclosure compartments (13,14) are limited on the side of the leading

enclosure edges by auxiliary fingers (11,12), and through coupling of the drives for the conveying fingers (5,6) and the auxiliary fingers (11,12) the enclosure compartments (13,14) are limited to essentially the maximum dimension of the enclosures in the conveying direction at least during the deceleration phase of the conveying fingers and are reopened thereafter.

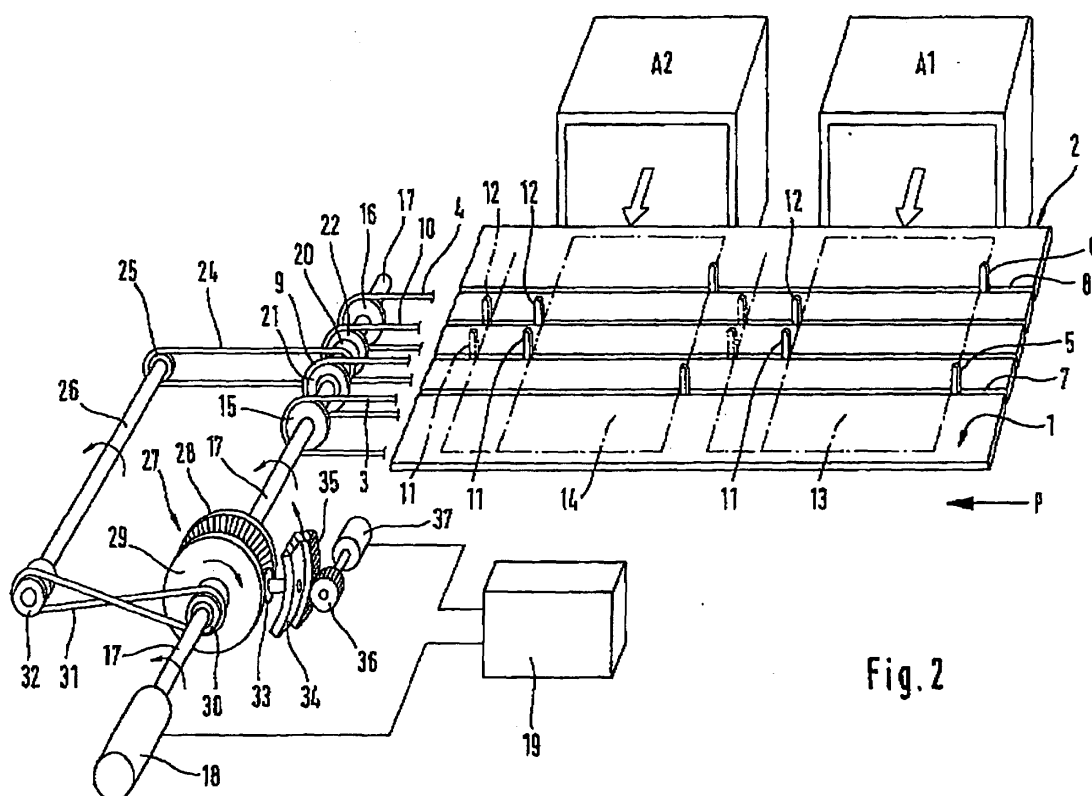


Fig. 2

Description

[0001] The invention concerns an enclosure-collating path, in particular for mail-processing installations, having pairs of conveying fingers on driven main chains or main belts which are guided parallel to one another and circulate over chain wheels or rollers, the conveying fingers projecting beyond the surface of the collating path in the region of the top strands of the main chains or main belts and defining enclosure compartments in front of them, as seen in the conveying direction, it being possible for said enclosure compartments to be conveyed past at least one enclosure-ejecting station arranged over the course of the collating path.

[0002] With increasing work speeds of enclosure-collating paths and mail-processing installations, and thus increasing cycle speeds of the intermittent conveyance of the enclosure compartments in front of the pairs of conveying fingers, the difficulty arises in prior art systems that the pairs of conveying fingers must be set in motion with high acceleration at the start of each operating cycle and must be very rapidly decelerated prior to bringing an enclosure compartment to a stop in front of an ejecting station. The enclosures placed in the enclosure compartments by the ejecting stations follow the rapid accelerations and high decelerations of the pairs of conveying fingers as long as the weight of the enclosure and the friction between the bottom of the enclosure and the conveyor belt surface during the acceleration phase is not so large that the edge regions of the enclosures resting against the pairs of conveying fingers are pushed in or folded up, and on the other hand during the deceleration phase the mass of the enclosure is not too large and the friction between the bottom of the enclosure and the conveyor belt surface is not too small, so that an enclosure or a stack of enclosures separates from the surface ahead of them in the conveying direction and slides toward the rear surface of the pair of conveying fingers ahead of it when the pairs of conveying fingers are brought to a stop as soon as the main chains or main belts are stopped. In this case, the enclosures or a stack of enclosures would no longer reach a position precisely opposite or beneath an ejecting station when an enclosure compartment is brought to a stop. The aforementioned problem also occurs with continuous conveying of the enclosure compartments when all enclosure compartments must be abruptly brought to a standstill in the event of a problem.

[0003] The problem can be managed within certain limits by influencing the frictional properties of the surface of the enclosure-collating path. However, difficulties arise in the event of wide variations in the frictional properties of the surfaces of the individual enclosure pieces, which are collated into a stack of enclosures in the enclosure compartments, where it may happen in the course of collating a stack of enclosures that a comparatively heavy, thick enclosure with only minimal friction properties relative to the surface of the enclosure

below comes to rest on a comparatively thin enclosure having good friction properties relative to the surface of the collating path. In this situation, if an enclosure compartment is rapidly brought to a stop after forward conveyance of the enclosure stack by the pairs of conveying fingers, the e.g. comparatively thick and heavy enclosure resting on top of the e.g. thin bottommost enclosure slips further in the conveying direction on the surface of the enclosure collating path when the pairs of conveying fingers are brought to a stop, which can lead to service interruptions. This phenomenon is discussed in detail below.

[0004] Accordingly, the object of the invention is to design an enclosure-collating path of the type initially defined such that service interruptions in the region of the enclosure-ejecting stations and especially in front of an inserter station are avoided, even at high speeds of the driven main chains or main belts and the pairs of conveying fingers arranged thereon which define the enclosure compartments in front of them, and even with wide variations in the frictional properties of the surfaces of the enclosures to be collated relative to the surface of the collating path and relative to each other.

[0005] This object is attained in accordance with the invention by the features of the attached claim 1.

[0006] Advantageous embodiments and further developments are the object of the claims dependent on claim 1, the content of which is expressly incorporated as part of this description without their wording being repeated here.

[0007] The basic concept of the invention consists in defining an enclosure compartment not only in the region ahead of the front surfaces of the pairs of conveying fingers of the main chains or main belts, but also by the rear sides of auxiliary fingers at the front edges of the enclosures in the conveying direction, wherein, however, the enclosure compartment in any case has greater dimensions in the conveying direction than the maximum format of the enclosures when it is located in the region of an ejector station, while during its segments of motion along the collating path the enclosure compartment is reduced in size with respect to the conveying direction to a size that essentially corresponds to the maximum dimension of the enclosure format in the conveying direction, at least when the conveying fingers are in a deceleration phase due to stopping of the enclosure compartment, for example in the region of an ejector station or to bring the enclosure compartment to a stop in front of an inserter station or during a shutdown resulting from a problem.

[0008] Advantageous embodiments of the invention are explained below with reference to the drawings.

Fig. 1 is a schematic, perspective view of a section of an enclosure-collating path to explain in detail the problems on which the invention is based;

Fig. 2 is a schematic, perspective view of a part of the enclosure-collating path proposed here;

Fig. 3 is a schematic, perspective view, similar to that in Fig. 2, of an enclosure-collating path according to another embodiment; and

Figs. 4A and 4B are position-time diagrams that explain the dimensions of an enclosure compartment with respect to the conveying direction during the passage of an enclosure compartment along the collating path.

[0009] Fig. 1 shows a section of the surface 1 of an enclosure-collating path 2, as well as continuous, circulating main chains or main belts 3 and 4 that are guided under the surface 1 by chain wheels or rollers not shown, and that are intermittently driven in the selected example embodiment. The main chains or main belts 3 and 4 are provided with conveying fingers 5 and 6 which project above the surface 1 of the collating path through slits 7 and 8 in an upper part of the collating path in the region of the top strands of the main chains or main belts 3 and 4. Each pair of conveying fingers 5, 6 defines a collating compartment in front thereof in the conveying direction corresponding to the arrow P, which collating compartment in prior art enclosure-collating paths extends in practice to the rear side of the pair of conveying fingers 5, 6 that is attached to the main chains or main belts 3 and 4 ahead of said collating compartment in the conveying direction. The dimension of the enclosure compartment resulting in practice here is labeled in Fig. 1 as B.

[0010] If an enclosure b1 has first been precisely ejected onto the enclosure-collating path 2 in the region of an enclosure-ejecting station such that its trailing edge has come to rest with a certain safety margin essentially directly in front of the front sides of the conveying fingers 5, 6 shown on the left side of Fig. 1, as is shown in Fig. 1, while the pair of conveying fingers 5, 6 was stopped in the region of the enclosure-ejecting station, then the enclosure b1 can immediately be accelerated by the pair of conveying fingers 5, 6 after the drive for the main chains or main belts 3, 4 is turned back on, and can be conveyed to the region of the next enclosure-ejecting station and be brought to a stop there by once again turning off the drive for the main chains or main belts 3, 4. In this process, the trailing edge of the enclosure b1 does not, as a rule, separate from the front sides of the pair of conveying fingers 5, 6, since adequate friction between the bottom side of the enclosure b1 and the surface 1 of the upper part of the collating path 2 results in sufficient deceleration of the enclosure b1 when the motion of the pair of conveying fingers 5, 6 is brought to a stop with appropriate deceleration levels.

[0011] However, if the friction between the bottom side of the enclosure b1 and the surface 1 of the upper part of the collating path 2 were to result in a deceleration of the enclosure b1 that was less than the deceleration of the pair of conveying fingers 5, 6 when they were brought to a stop in the region of an ejecting station, then the enclosure b1 would slide a certain distance fur-

ther in the conveying direction as indicated by the arrow P, so that a next enclosure b2 would not be placed with essentially precise alignment on the enclosure b1 in the next ejecting station. The difficulty would then arise that while the additional enclosure b2 would indeed rest with its rear edge at the front sides of the pair of conveying fingers 5, 6 as indicated in Fig. 1 by broken lines, the enclosure b1 below it would be shifted forward in the conveying direction and would not rest with its trailing edge at the front sides of the pair of conveying fingers 5, 6.

[0012] Now if the friction between the top side of the enclosure b1 and the bottom side of the enclosure b2 placed on top of it is very small, then when the conveying fingers 5, 6 are restarted and accelerated, the top enclosure b2 will initially be pushed over the bottom enclosure b1, and the stack of enclosures formed will be aligned again. However, if the friction between the top side of the bottom enclosure b1 and the bottom side of the top enclosure b2 is large, then the top enclosure b2, driven by the conveying fingers 5, 6 that are now set in motion again, will maintain the misalignment and push the enclosure b1 on which it rests before it into the region of the next ejecting station or the region of the inserter station, which can cause service interruptions.

[0013] However, Fig. 1 shows a further operating case that causes service interruptions. Assume that, at a first ejecting station, the enclosure b1 has been properly placed on the surface 1 of the upper part of the collating path at a very small distance from the front sides of the pair of conveying fingers 5, 6, and at the next station the enclosure b2 was in turn properly placed in front of the front sides of the pair of conveying fingers 5, 6, essentially in alignment with the enclosure b1 below it. When the enclosure stack formed by enclosures b1 and b2 is conveyed to the region of the next ejecting station or the inserter station and the conveying fingers 5, 6 are then decelerated to a standstill by turning off the drive to the main chains or main belts 3, 4, then in the case of very low friction between the top side of the enclosure b1 and the bottom side of the enclosure b2 located thereon, the latter enclosure b2, especially if it has a relatively large mass, cannot be adequately decelerated and slides on the surface of enclosure b1 to the position shown in Fig. 1. In this position the insertion of the enclosure stack formed by enclosures b1 and b2 is impossible or causes difficulties, if the enclosure stack composed of enclosures b1 and b2 has the form shown in Fig. 1 when it is located in the region of another ejecting station where a third enclosure is deposited, then when the pair of conveying fingers 5, 6 accelerates as they are restarted after ejection of the third enclosure, it is possible that increased friction between the bottommost enclosure b1 and the surface 1 of the upper part of the collating path 2 in the section where the more massive enclosure b2 rests, in combination with the frictional forces that act between the bottom side of the drooping part of the enclosure b2 located on the left in Fig. 1 and the surface

1 of the upper part of the collating path, will have the result that the bottommost enclosure b1 can no longer be pushed under the enclosure b2, but instead that its region located on the right in Fig. 1 in front of the front sides of the pair of conveying fingers 5, 6 folds or bows upward, thus causing service interruptions.

[0014] These problems do not arise in an enclosure-collating path of the type specified here.

[0015] In the embodiment according to Fig. 2, the conveying fingers 5, 6 of the main chains or main belts 3, 4 project outward in the region of their top strands through outer longitudinal slits 7, 8 of the upper part of the collating path 2, as can be seen from Fig. 2. Parallel to and between the main chains or main belts 3, 4 are supported continuous circulating auxiliary chains or auxiliary belts 9, 10 which are equipped with auxiliary fingers 11, 12. These auxiliary fingers project above the surface 1 of the collating path in the region of the top strands of the auxiliary chains or auxiliary belts 9, 10 and in pairs define behind them the front ends of respective enclosure compartments 13, 14 with respect to the conveying direction shown by the arrow P.

[0016] Chain wheels or rollers 15 or 16, around which the main chains or main belts 3 or 4 are placed, are used to drive them, and to this end are fastened to a shaft 17, which is rigidly coupled to a drive motor 18, which is supplied with energy in a controlled manner by a control device 19. Naturally, the main chains or main belts 3, 4 are placed around idler chain wheels or idler rollers at the end of the collating path opposite the conveying direction; this is not shown, however, in order to simplify the representation in Fig. 2. Also not shown in the drawing are bearing arrangements for supporting the various shafts or axles of the drive of the enclosure-collating path, but such details are quite well known to practitioners of the art.

[0017] Rotatably supported on the shaft 17 is an approximately spool-shaped chain wheel carrier or roller carrier 20, which has one auxiliary chain wheel or one auxiliary roller 21 or 22 on each of its axially front and axially rear end faces. Placed around the auxiliary chain wheels or auxiliary rollers 21 or 22 are the auxiliary chains or auxiliary belts 9 or 10, which of course are placed around appropriate idler chain wheels or idler rollers in the region of the end of the collating path opposite the conveying direction. This detail is also omitted in the drawing to simplify the representation. Placed around the spool-shaped auxiliary chain wheel carrier or auxiliary roller carrier 20 is a drive chain 24, which is guided around a drive chain wheel 25, which sits on an auxiliary drive shaft 26.

[0018] The drive shaft 17 for the main chains or main belts 3 or 4 and the auxiliary drive shaft 26 for driving the auxiliary chains or auxiliary belt 9 or 10 are now coupled together in accordance with the concept specified here such that the mutual separation of the pairs of conveying fingers 5, 6 and the pairs of auxiliary fingers 11, 12 in the conveying direction along the arrow P is greater

than the maximum enclosure format in the conveying direction when each enclosure compartment 13, 14 is at a standstill in front of enclosure-ejecting stations, which are schematically indicated in Fig. 2 at A1 and A2, and also in front of an inserter station, not shown in Fig. 2, which may follow the ejecting station A2 in the conveying direction, but during at least significant portions of the stopping process corresponds essentially to the size of the enclosure format in the conveying direction when the enclosure compartments 13, 14 are conveyed in front of the ejector stations A1, A2, are brought to a standstill there, and are again conveyed away after ejection of an enclosure in the enclosure conveyance process.

[0019] Such a coupling of the drives for the shaft 17 and the auxiliary shaft 26 is achieved in the embodiment in Fig. 2 by means of a differential gear mechanism 27 that is schematically indicated in Fig. 2.

[0020] The differential gear mechanism 27 contains a bevel gear 28 fastened to the shaft 17 and, rotatably supported on the shaft 17, an associated bevel gear 29 with a pulley 30 fastened thereto around which a crossed drive belt 31 is guided to a pulley 32 sitting on the auxiliary shaft 26, wherein the pulleys 30 and 32 have the same effective diameter. The spool body of the chain wheel carrier or roller carrier 20 and the chain wheel 25 are also equal in diameter. (Needless to say, the reversal of rotational direction by the aforementioned crossed drive belt 31 can be achieved in many other forms in practical embodiments.)

[0021] Differential bevel gears of the differential gear mechanism 27, one of which is indicated at 33 in Fig. 2, are supported on a carrier ring 34, of which only a small segment is shown in Fig. 2, which has a ring gear 35 in which a drive pinion 36 of a positioning motor 37 engages. The positioning motor 37 is supplied with energy in a controlled manner by the control unit 19 such that, by rotating the carrier ring 34 of the differential gear mechanism 27, it is capable of generating specific phase shifts between the shafts 17 and 26, which are otherwise intermittently driven in a synchronous manner by the motor 18.

[0022] In particular, actuation of the positioning motor 37 by the control unit 19 when the drive motor 18 is rotating or stopped, in such a manner that the differential gear carrier ring 34 is turned counterclockwise with reference to the representation in Fig. 2, has the result that the auxiliary fingers 11, 12 approach the associated conveying fingers 5, 6 of the relevant enclosure compartment 13 or 14 and thus that a shrinking in size of the enclosure compartment occurs relative to the conveying direction, whereas a clockwise rotation of the carrier ring 34 with reference to the representation in Fig. 2 has the result that the auxiliary fingers 11, 12 move away from the associated conveying fingers 5, 6 to enlarge the enclosure compartment 13, 14.

[0023] Fig. 3 shows an embodiment of the enclosure-collating path, with an otherwise identical embodiment

to that in Fig. 2, in which the drive shaft 17 for the main chain wheels or main rollers 15, 16 are coupled to a main motor 18, while the auxiliary shaft 26 for driving the auxiliary chain wheels or auxiliary rollers 21, 22 is coupled to a servomotor 40. The main motor 18 and the servo-
 5 motor 40 are provided with energy in a controlled manner by the control unit 19 and, if the motors 18 and 40 are stepper motors for example, receive drive pulses from a common pulse source 41 of the control unit 19. While the main motor 18 is directly supplied with drive pulses from the controlled pulse source 41, the servo-
 10 motor 40 receives drive pulses 41 through a pulse divider 42 with a finely controllable division ratio.

[0024] Another possible design for the control unit 19 provides means for arbitrary phase shift of the drive volt-
 15 ages for the main motor 18 and the servomotor 40 relative to one another.

[0025] Control of the differential gear mechanism 27 and control of the drive voltages for the main motor 18 and the servo motor 40 by the control unit 19 can also
 20 be carried out according to an embodiment not shown in the drawings in such a manner that, at least during the phase of decelerating the conveying fingers 5, 6, the auxiliary fingers 11, 12 are located ahead thereof in the conveying direction indicated by the arrow P at a distance
 25 corresponding to the maximum enclosure format so as to hold an enclosure stack or an individual enclosure with its trailing edge essentially resting against the front sides of the conveying fingers 5, 6, but then, in any case immediately before the conveying fingers 5, 6 are
 30 again accelerated, said auxiliary fingers are advanced in the transverse direction to lie flush next to the conveying fingers 5, 6 of the next enclosure compartment 14, in order for example to assist there in conveying away and accelerating, for example, a catalog placed
 35 on an intermediate deck as an enclosure from, for example, the region of the ejecting station A2, together with enclosures located under the intermediate deck, wherein the intermediate deck, which is not shown in the drawing, is designed such that the conveying fingers 5, 6 can move under it, while the auxiliary fingers 11, 12 project through a wide central slot in the intermediate
 40 deck and are thus able to grip and accelerate the enclosure deposited there.

[0026] Fig. 4A shows a schematic position-time diagram to illustrate the dimensions of an enclosure compartment between the conveying fingers 5, 6 represented by the path curve 50, and the auxiliary fingers 11, 12 represented by the path curve 51. If the conveying fingers 5, 6 and the auxiliary fingers 11, 12 had a large
 45 separation promoting problem-free enclosure ejection in the region of the ejecting station A1, they maintain this large separation during the simultaneous and synchronous startup of the conveying fingers and auxiliary fingers at time t_0 through time t_1 . At this time the auxiliary fingers 11, 12 are brought to a stop while the conveying
 50 fingers continue to move until the time t_2 , thereby reducing the longitudinal dimension of the enclosure compart-

ment to a separation from the auxiliary fingers 11, 12 that corresponds to the maximum dimension of the enclosures in the conveying direction. Once this state is achieved, the enclosure compartment is located precisely in the region of the ejecting station A2. Here, at
 5 time t_3 , a comparatively short time after t_2 , the drive for the auxiliary fingers 11, 12 is placed in operation again and shortly thereafter is stopped again at time t_4 in such a manner that the enclosure compartment now once
 10 again has the large dimension that promotes problem-free ejection of an enclosure, and such problem-free ejection of an enclosure can occur during the period between times t_4 and t_5 . Starting at time t_5 the process repeats itself as described above for the period from to t_4 .
 15 t_4 .

[0027] An alternative control option is indicated in Fig. 4A by a dotted-and-dashed line 52. The path curve 51 can be modified in accordance with the progression along the dotted-and-dashed line 52. In particular, this
 20 means that after ejection of an enclosure has occurred, for instance at the ejecting station A2 prior to startup of the conveying fingers 5, 6 as shown by the path curve 50, the auxiliary fingers 11, 12 are moved opposite the conveying direction at approximately time t_5 so that the
 25 expansion or elongation of the enclosure compartment between times t_3 and t_4 is reversed, and now at time t_5 when both the conveying fingers 5, 6 and the auxiliary fingers 11, 12 are started up again, the enclosure stack is conveyed to the next ejecting station or the inserter
 30 station while being held between the conveying fingers and the auxiliary fingers.

[0028] It must be noted here that the path curves 50, 51 and 52 in Fig. 4A are shown in an idealized fashion with discontinuous velocity transitions. In practice, how-
 35 ever, the accelerations and decelerations of the conveying fingers 5, 6 and the auxiliary fingers 11, 12 take place with finite values so that the path curves 50, 51, 52 have rounded regions between their straight-line motion segments and their straight-line dwell segments as shown in Fig. 4B. Thus the auxiliary fingers 11, 12 tend to start
 40 a deceleration phase at time t_1 , while the conveying fingers 5, 6 are not decelerated until the time t_2 , as per Fig. 4B. In this way, the reduced longitudinal dimension of the enclosure compartment is finally achieved at time t_3 , and the enclosure compartment is thus gradually
 45 closed during the period between times t_1 to t_3 . As an alternative to the representation in Fig. 4B, control by the control unit 19 can also be provided through which both the conveying fingers 5, 6 and the auxiliary fingers 11, 12 simultaneously enter their deceleration phases
 50 at time t_2 , wherein however a significantly greater deceleration is provided for the auxiliary fingers 11, 12 such that the distance between the conveying fingers 5, 6 and the auxiliary fingers 11, 12 finally corresponds to the maximum enclosure dimension at time t_3 .

[0029] As previously indicated several times, the invention also concerns collating paths with continuously moving enclosure compartments where such enco-

sure-collating paths work together with enclosure-ejecting stations, which place or eject enclosures, for example from above, into the enclosure compartments that continuously move under the ejecting stations.

[0030] If a problem occurs in such enclosure-collating paths, an abrupt stoppage of the main chains or main belts and the conveying fingers arranged thereon takes place, which can then cause the enclosures of an enclosure stack to slip or slide further when the conveying fingers are abruptly stopped if the enclosure compartments are defined solely by the conveying fingers on the main chains or main belts.

[0031] However, the invention makes provision to always limit the enclosure compartments to a dimension in the conveying direction corresponding to the maximum enclosure format during the phase of deceleration of the enclosure compartments by means of auxiliary fingers. This means that with continuous motion of the enclosure compartments, in the case of a problem the auxiliary fingers are for instance brought to a stop more rapidly than the conveying fingers, or else the auxiliary fingers are braked earlier than the conveying fingers, wherein however care is taken to ensure that the auxiliary fingers and the conveying fingers never approach one another in the conveying direction closer than the dimension specified by the maximum length of the enclosures in the conveying direction.

Claims

1. A mail processing apparatus having a collating transport, the collating transport having pairs of conveying fingers (5, 6) on driven main chains or main belts (3, 4) which are guided parallel to one another and circulate over chain wheels or rollers (15, 16), the conveying fingers (5, 6) projecting beyond a top surface (1) of the collating transport (2) and defining enclosure compartments (13, 14) said enclosure compartments conveyed past at least one enclosure-ejecting station (A1, A2) arranged over the course of the collating transport (2), **characterized in that** circulating auxiliary chains or auxiliary belts (9, 10) are guided parallel to the main chains or main belts (3, 4), and are provided with auxiliary fingers (11, 12) which project beyond the top surface (1) of the collating transport (2) and define behind them the front end of a respective enclosure compartment (13, 14) and **in that** a drive (18) for the main chains or main belts (3, 4) and a drive (20, 24, 25, 26) for the auxiliary chains or auxiliary belts (9, 10) are movably coupled to one another such that the mutual spacing between the pairs of conveying fingers (5, 6) and the pairs of auxiliary fingers (11, 12) is a first distance apart while in motion and a second smaller distance apart while at rest.
2. The mail processing apparatus of Claim 1, further **characterized in that** a coupling between the drive (18) for the main chains or main belts (3, 4) and the drive (20, 24, 25, 26) for the auxiliary chains or auxiliary belts (9, 10) is such that the pairs of conveying fingers (5, 6) and the pairs of auxiliary fingers (11, 12) are moved towards one another before the beginning of an operation of braking the conveying fingers (5, 6) and/or at the beginning of the operation of braking the conveying fingers and/or once the operation of braking the conveying fingers has begun.
3. The mail processing apparatus of Claim 1 or 2, further **characterized in that** a drive shaft (17) of the drive for the main chains or main belts (3, 4) and a drive shaft (26) of the drive for the auxiliary chains or auxiliary belts (9, 10) are coupled to a drive motor (18) via a differential gear mechanism (27) such that they circulate synchronously in the same direction of rotation when a compensating-wheel carrier (34) of the differential gear mechanism (27) is at a standstill, and **in that** the compensating-wheel carrier (34) is subjected to the action of an actuating motor (37), by means of which it is possible to change the phase positions of the rotation of the drive shafts (17, 26) relative to one another.
4. The mail processing apparatus of Claim 1 to 2, further **characterized in that** the drive for the main chains or main belts (3, 4) contains a main motor (18) and the drive for the drive for the auxiliary chains or auxiliary belts (9, 10) contains a servomotor (40), and **in that** the main motor (18) and the servomotor (40) are connected to a control unit (19) which feeds the motors, controlled manner, drive supply voltages, of which the mutual phase position can be changed.
5. The mail processing apparatus of Claim 1 to 4, further **characterized in that** mounted in the region of at least one enclosure-ejecting station, on the top side of the collating transport (2), is an intermediate deck beneath which the rows of conveying fingers (5, 6) can be moved for enclosure-conveying purposes, while the auxiliary fingers (11, 12) are longer than the conveying fingers (5, 6) and project through the intermediate deck, and **in that** the coupling between the drives for the main chains or main belts and for the auxiliary chains or auxiliary belts is configured such that, prior to acceleration of the conveying fingers, the auxiliary fingers are moved from a position for bounding a certain enclosure compartment at the front, as seen in the conveying direction, into a position in transverse alignment alongside the conveying fingers of a preceding enclosure compartment at the beginning of an ejecting station equipped with the intermediate deck and, upon acceleration of the conveying fingers, an en-

closure ejected onto the intermediate deck is accelerated by the auxiliary fingers synchronously with the enclosure-conveying operation by the conveying fingers of the relevant enclosure compartment, said fingers running through beneath the intermediate deck. 5

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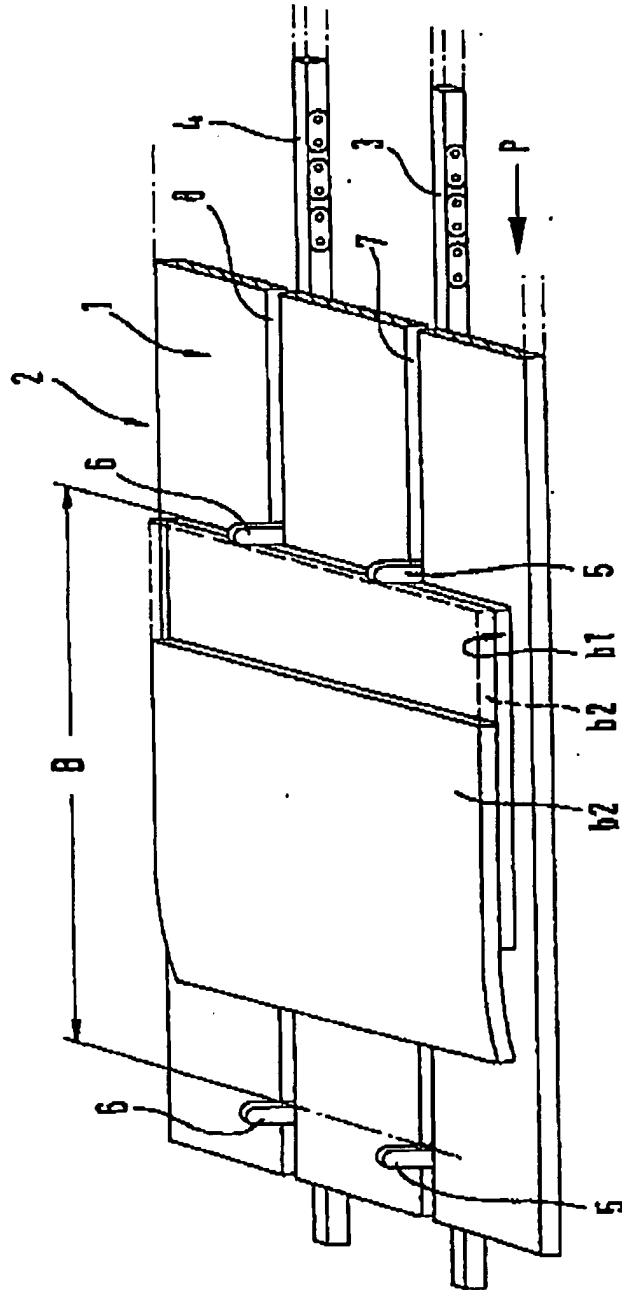
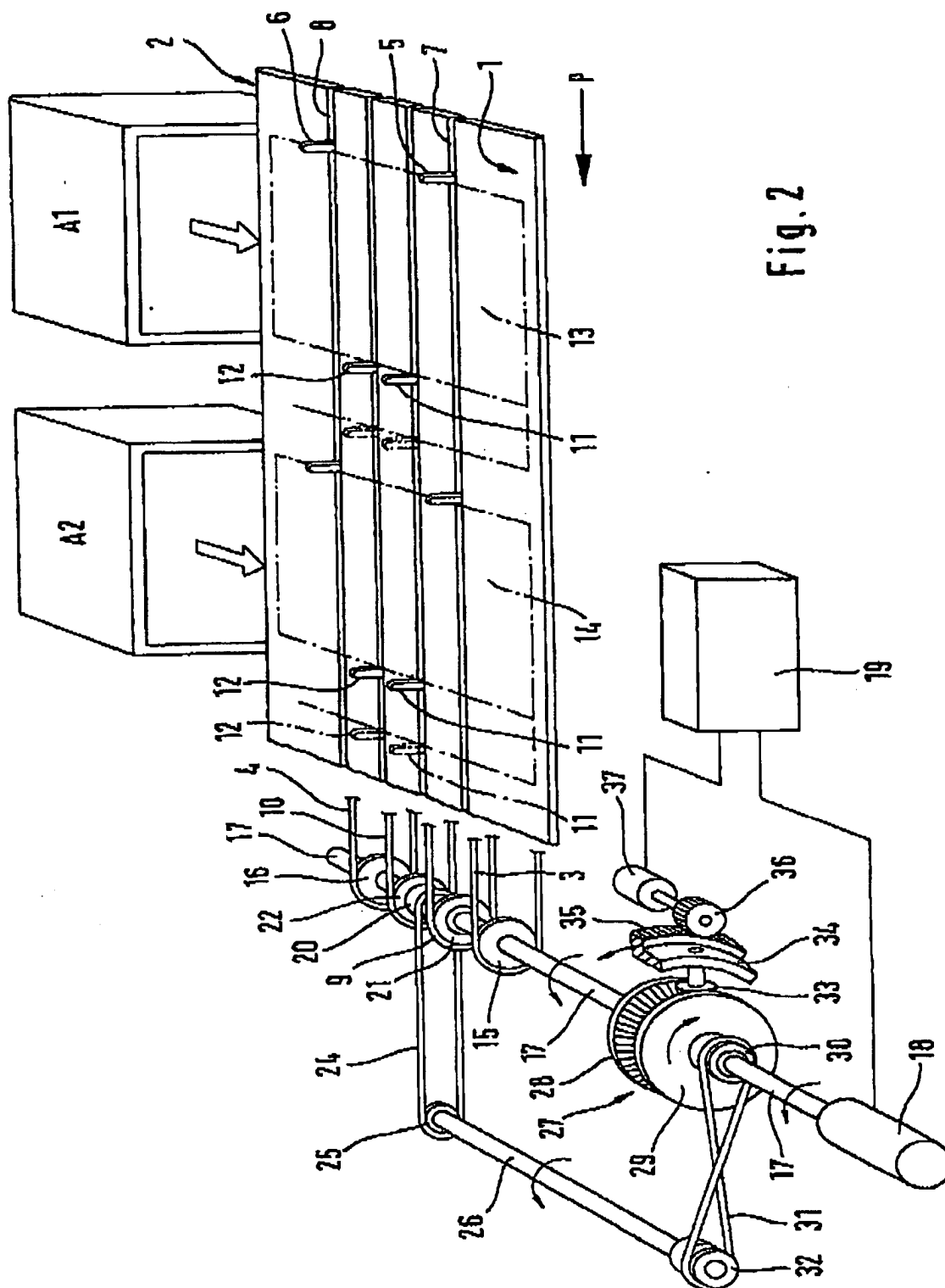


Fig. 1



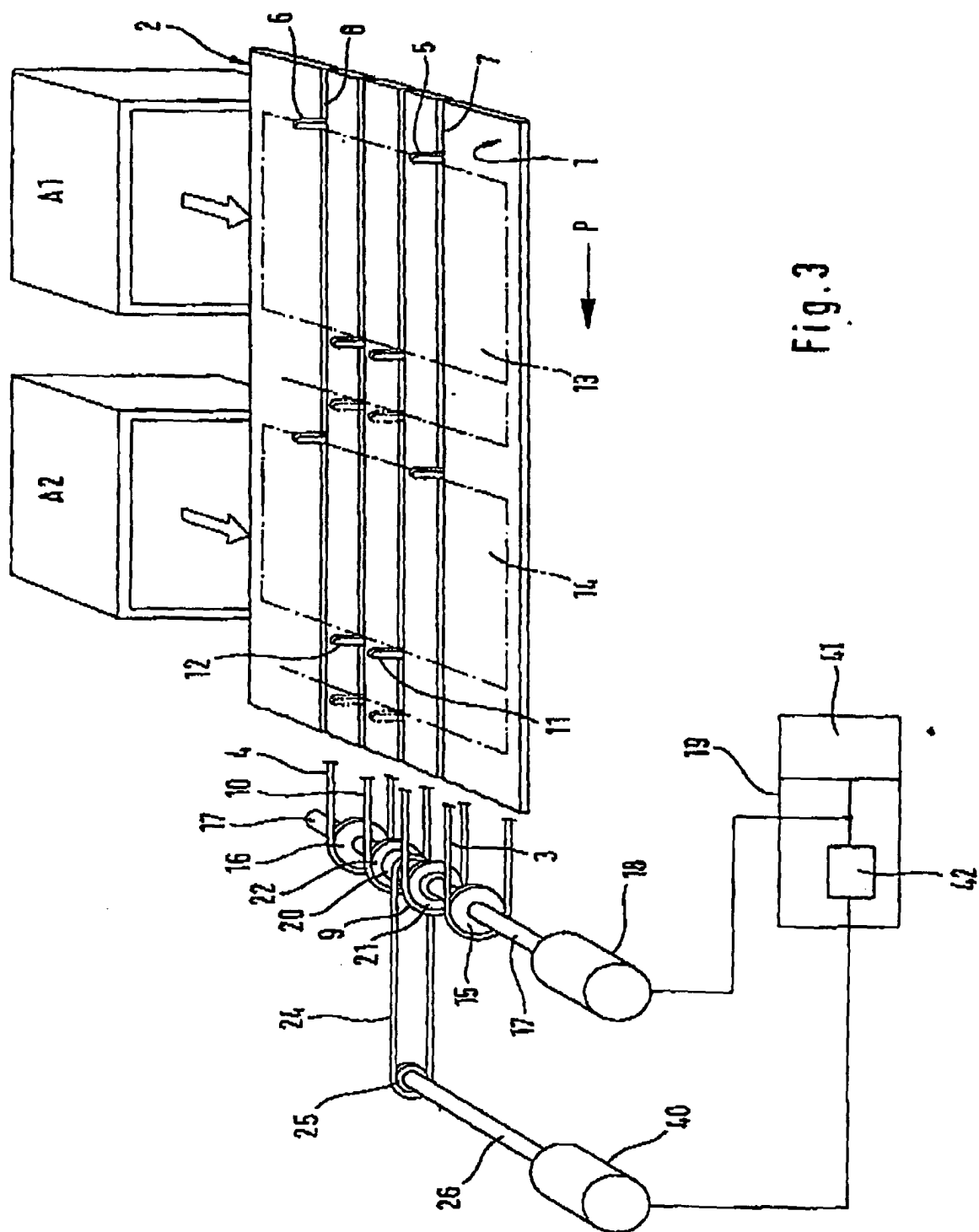


Fig. 4A

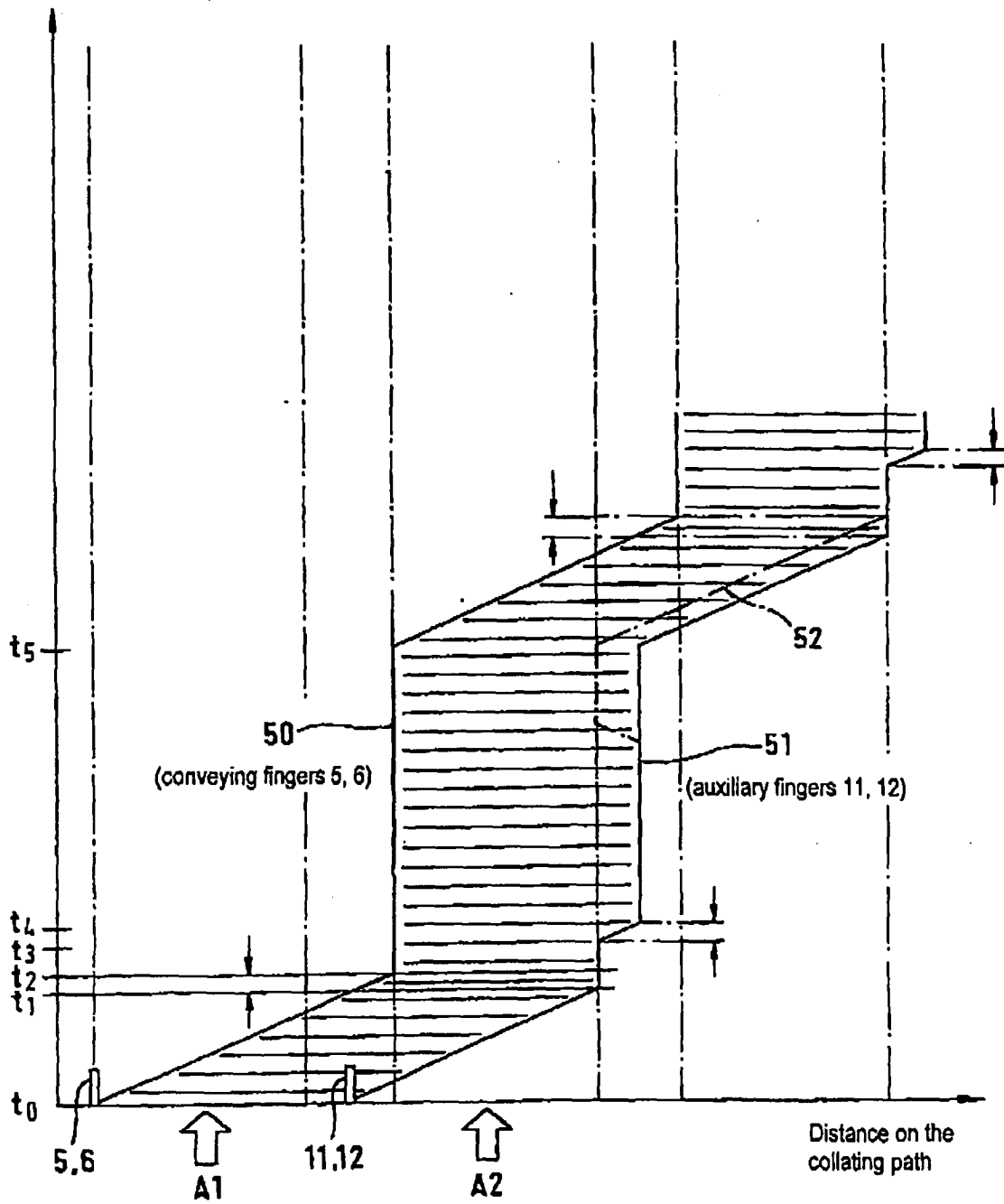


Fig. 4B

