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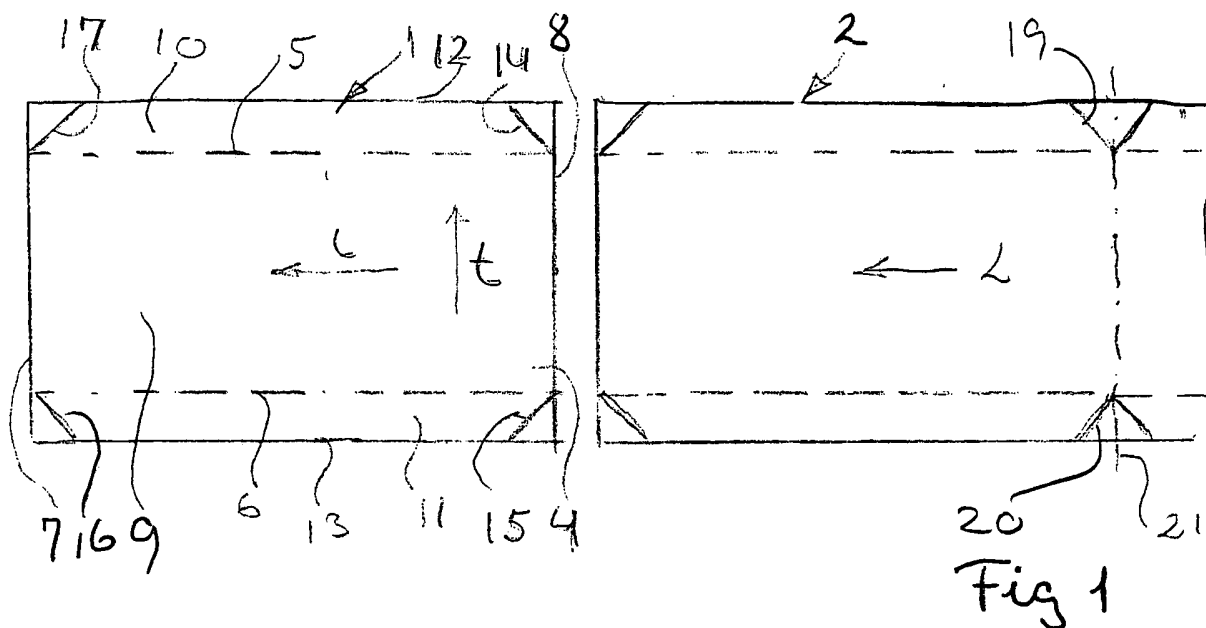
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(54) **Film cover; method and apparatus for providing a cover element from a continuous web**

(57) A folded cover element (1), which can be raised to provide a cover (3), is provided by folding a substantially rectangular sheet of a flexible, yielding plastic film. The cover element (1) includes a cover panel section (9) and a pair of opposed sidewall sections (10, 19), which are folded around the folded edges (12, 13) extending parallel to the respective adjacent side edge (5, 6) such as to abut the cover panel section (9). Furthermore, at their opposed ends, each sidewall section (10, 11) is

welded to the cover panel section (9) along inclining end seams (14, 15, 16, 17), each extending indiningly from a starting point in or near the respective folded edge (12, 13) in the direction towards the adjacent side edge (5, 6) at an angle of substantially 45° to the respective folded edge (12, 13). Moreover, a continuous web of a large number of cover elements is provided as well as a method and an apparatus for raising a cover element for providing a cover and affixing said cover to the upper open end of a bin.



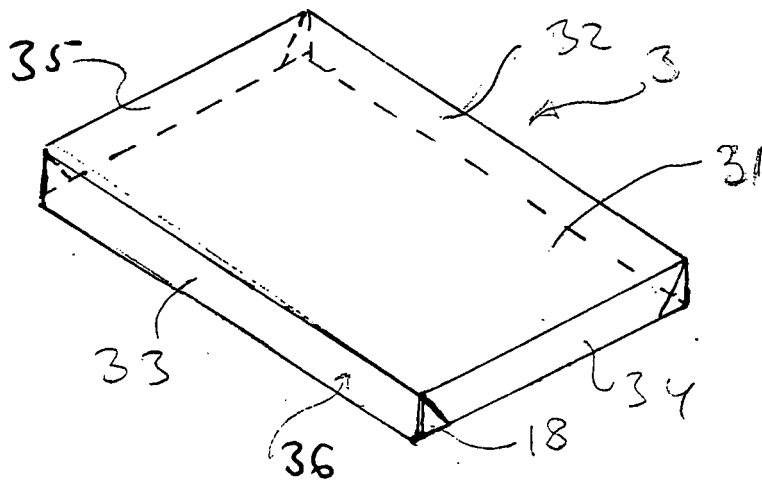


Fig 2

## Description

**[0001]** The present invention relates to a folded cover element, which can be raised to provide a cover adapted to be placed on an open upper end of a bin, and as stated in the introductory part of claim 1. Furthermore the invention relates to an continuous web of a large number of cover elements with the features stated in claim 3, a method for providing a cover element from a continuous web, raising said cover element to provide a cover and to affix said cover to the upper end of a bin and with the steps stated in claim 4, as well as an apparatus for providing a cover element from a continuous web, raising said cover element to provide a cover and to affix said cover to the upper end of a bin and with the features stated in claim 9.

**[0002]** At slaughterhouses, a large number of plastic bins are used for storing and transporting cut out pieces of meat. Furthermore, such plastic bins, which are standardised, are also used for transporting pieces of meat placed herein between slaughterhouses and buyers. After use, the bins are returned to the slaughterhouse for re-use after cleaning.

**[0003]** In order to prevent the pieces of meat stored in the bins from being contaminated, e.g. by dirt falling onto them upon piling up the bins, a plastic bag is placed in the bins prior to filling the bins with the pieces of meat. When the bins, i.e. the bags, have been filled, the bags are closed loosely. The placing of the bags in the bins and the subsequent loose closing of the bags is effected manually and is time-consuming.

**[0004]** Thus, there is great demand for a more rational and fast method, which can be automatised, for closing bins, especially at slaughterhouses.

**[0005]** To achieve this object the present invention provides a folded cover element, which can be raised to provide a cover adapted to be placed on the open, upper end of a bin, and having the features stated in claim 1.

**[0006]** A cover element with the features stated in claim 1 can be manufactured easily and at low cost, and can be raised easily to provide a cover and be placed tightly fitting on the upper, open end of the bin as it is made of a flexible, yielding plastic film. The raised cover can be placed manually by e.g. stretching one cover side wall, bringing it into engagement with its corresponding bin side wall, effecting a stretching of the cover in the transverse direction and pulling the second cover side wall down over the second bin side wall, while simultaneously ensuring that the cover end walls are placed along the outer upper areas of the bin end walls. In most cases, however, it is preferred to automate the affixing of the cover.

**[0007]** According to the invention, the inwardly folded opposing side wall sections may substantially have the same width measured between the folded line and the side edge.

**[0008]** Furthermore, according to the invention, the distance between the starting point of the inclining end

seams and the adjacent end edge may be substantially identical at the two opposing ends. Preferably, said distance substantially corresponds to the width of the two opposing side wall sections, whereby the skirt of the cover substantially has the same height all the way around and provides more appealing looks to the bin provided with the cover.

**[0009]** Moreover, the cover element according to the invention may be included in a continuous web of a large number of cover elements, where the longitudinal direction of the cover elements extends in the longitudinal direction of the web. This embodiment of the invention is particularly advantageous on an automatised raising and affixing of a cover, which has been provided from a cover element according to the invention.

**[0010]** Furthermore, the invention relates to a continuous web of a large number of cover elements, the longitudinal direction of the cover elements of said web extending in the longitudinal direction of the web and the cover elements being provided by transverse separation of the web for forming end edges of the cover elements.

**[0011]** Advantageously the web is wound up to provide a roll of cover elements. This facilitates the transportation and the handling of cover elements upon automatisation of the raising of cover elements to provide a cover and the affixing hereof to a bin.

**[0012]** As mentioned, the invention furthermore relates to a method for providing a cover element from a continuous web and raising said cover element to provide a cover as well as affixing hereof to the upper open end of a bin and with the features stated in claim 4. The method enables a fast and efficient affixing of covers, which may be automatised.

**[0013]** According to an embodiment of the method, the vertical relative movement between the first pair and the second pair of cover raising plates in relation to the web mentioned in step g may be provided by a vertical upward movement of the pairs of film raising plates.

**[0014]** Furthermore, according to the invention, the longitudinal and the transverse movements of the first set and the second set of cover raising plates mentioned in method step h may be provided by a turning of the respective cover raising plates around their axes.

**[0015]** Furthermore, the relative movement of the first pair and the second pair of cover raising plates in relation to the bin mentioned in method step k may be provided by a vertical downward movement of the cover raising plates.

**[0016]** Moreover, the cover raising plates mentioned in method step l may be brought out of engagement with the skirt of the cover by turning each of said cover raising plates down and/or moving each set of cover raising plates downwards.

**[0017]** Finally, as mentioned, the invention relates to an apparatus for providing a cover element from a continuous web and for raising said cover element to provide a cover as well as for affixing hereof to the upper end of a bin and with the features stated in claim 9. By means

of said apparatus, a cover element can be raised fast and efficiently and can be placed tightly encasing around the upper open end of a bin.

**[0018]** According to the invention, the movable raising arms of the first pivot arm and the movable raising arms of the second pivot arm may be mounted turnably about respective axis on the respective pivot arm for a turning movement between the retracted starting position and the extended engagement position.

**[0019]** Finally, the bin support according to the invention may be constituted by a conveyor, such as a band conveyor, chain conveyor or roller conveyor adapted to convey the bin to a position anticipated for affixing the cover as well as for removing the bin from the apparatus after affixing the cover.

**[0020]** The invention is explained in detail below with reference to the drawings, in which:

Fig. 1, shows a part of a continuous web of folded cover elements, and from which a cover element has been separated, seen from above,

Fig. 2 shows a perspective view of the separated cover element in Fig. 1 in a raised condition,

Fig. 3 is a perspective view from above of a bin, on which the cover element shown in Fig. 2 may be placed,

Fig. 4 shows a perspective view of an apparatus according to the invention, certain screens having been removed for the sake of clarity,

Fig. 5 is a view corresponding to Fig. 4, further parts of the apparatus, including its frame, having been removed for the sake of clarity,

Fig. 6 is a perspective view of a web pulling arrangement of the apparatus,

Fig. 7 is a perspective view of a part of the cover raising and affixing device of the apparatus, and where pivot arms of the device, are in a position pivoted towards each other and are ready to take a grip of and raise the cover elements,

Fig. 8 is a view corresponding to Fig. 7, where the pivot arms of the cover raising and affixing device are in a position pivoted away from each other, and where a cover has been raised from the cover element,

Fig. 9 is a view corresponding to Fig. 8 of a cover raising and affixing device, where the spreading devices thereof have been brought into engagement with the end walls of the raised cover, and

Fig. 10 shows in a view corresponding to Fig. 9 of

the entire cover raising and affixing device of the apparatus, the cover being raised and arranged encasingly over the upper area of the bin.

**[0021]** Seen from above, Fig. 1 shows a cover element 1, which has been separated from a continuous web 2 of cover elements, said web, and as a result hereof also the separated cover element 1, having been provided from a flexible, yielding plastic film.

**[0022]** Contemplating a single separated cover element 1, it may be considered as having been provided from a substantially rectangular sheet of a flexible, yielding plastic film with a longitudinal direction l and a transverse direction t, an inner side (not visible) and an outer side 4 as well as a pair of opposing side edges 5, 6 and a pair of opposing end edges 7, 8.

**[0023]** The cover element 1 comprises of a cover panel section 9 and a pair of opposing side wall sections 10, 11, folded around folded edges 12, 13 extending parallel to the respective side edges 5, 6 such as to abut the cover panel section 9, inner side facing inner side. At opposing ends, the inwardly folded side wall sections 11, 12 are welded to the cover panel section 9, inner side facing inner side, along inclining end seams 14, 15, 16, 17. Each inclining end seam extends incliningly from a starting point in or near the respective folded edge 12, 13 towards the adjacent end edge 7, 8 at an angle of substantially 45° to the respective folded edge. Upon raising of the cover element 1 to provide a cover 3, the inclining end seams cause a double-walled, triangular flap, as shown by reference numeral 18 in Fig. 2, to appear at each of the outer corners of the cover.

**[0024]** In the raised condition the cover 3 includes a substantially rectangular panel sheet 31 as well as a pair of opposed cover sidewalls 32, 33 and a pair of opposed cover end walls 34, 35. The cover sidewalls and the cover end walls extend from the cover panel and jointly form a circumferential skirt 36. Furthermore the raised cover 3 has the aforementioned corner flaps 18.

**[0025]** From the above description of providing a cover element 1 from a separate, rectangular sheet, the providing of a continuous web 2 of cover elements, the longitudinal direction l of which corresponds to the longitudinal direction L and the web, will be obvious for a person skilled in the art, thus this is not described any further. For the sake of good order, however, it is to be mentioned that, upon transverse separation of the web along line 21, the V-shaped weld seams 19, 20 shown in Fig. 1 form end seams of cover elements abutting each other, and that the end edges of the cover elements are provided by said transverse separation.

**[0026]** Fig. 3 shows a bin 22 unto which the raised cover 3 shown in Fig. 2 may be affixed. The bin 22 has an overall substantially parallelepipedon form and includes a bottom 23 as well as a pair of opposed bin sidewalls 24, 25 and a pair of opposed bin end walls 26, 27. The bin sidewalls and the bin end walls extend from the bottom and jointly form a circumferential wall 28 with a

substantially rectangular upper edge 29.

**[0027]** By means of the dotted line 30, Fig. 3 moreover shows that the raised cover 3 shown in Fig. 2 for closing the bin is placed on the open upper end of the bin, the skirt 36 of the cover 3 extending encasingly and tightly around the upper area of the bin wall 28.

**[0028]** The apparatus 37 partly shown in Fig. 4 includes an apparatus frame 38 with two opposed vertically extending frame walls 39, 40. On or in the apparatus frame 38 a bin support 41 is provided in the form of a conveyor, a web pulling arrangement 42 placed above the support 41 and a cover raising and affixing device 43 placed between the web pulling arrangement and the bin support 41. Finally, the apparatus also includes a web supply and feeding mechanism 44 attached to the first frame wall 39.

**[0029]** In the length supply and feeding mechanism 44, a rolled up continuous web 2 of cover elements is placed. The web is fed upwards by means of a feeding roller 45 and a pressure roller 46 as well as additional rollers to the web pulling arrangement 42 in a way known per se, which is why this mechanism is not described any more detailed.

**[0030]** Referring to Figs. 5 and 6 as well, the web pulling arrangement 42 includes a first movable gripping device 47, being placed movable along horizontal guides 48, 49 arranged between the two frame walls 39, 40. The first gripping device 47 is movable between a starting position shown in Figs. 4 and 5, where the first gripping device grips the leading edge of the web received from the web supply and feeding mechanism 44, and a delivering position not shown. Furthermore, the web pulling arrangement 42 includes a stationary gripping device 50 placed at a distance from the starting position of the first gripping device substantially corresponding to the length of a cover element forming part of the web. The second stationary gripping device 50 is adapted to grip the leading edge of the web when the first movable gripping device 47 is in its delivering position and has pulled out a length of the web substantially corresponding to the length of a cover element. Seen in the feeding direction of the web, a knife 51 for a transverse cutting of the web is placed on the foremost side of the movable gripping device 47. The knife 51 is movable together with the movable gripping device 47.

**[0031]** With reference to Figs. 4 to 10, the cover raising and affixing device 43 includes two opposed slides 52, 53 guided vertically movable along vertical guides 54, 55, which are fixedly connected to the second frame wall 40 and vertical guides 56, 57, which are fixedly connected to the first frame wall 39. On the opposed slides, a first cranked pivot arm 59 is mounted turnably about a first axis 58 and a second cranked pivot arm 60, which is turnable on a second axis 61, which is parallel to the first axis 58 and placed at a transverse distance therefrom. The pivot arms are placed and moved symmetrically in relation to a central longitudinal plane through the apparatus. The first pivot arm 59 has a cranked area 62, and

the second pivot arm 60 has a cranked area 63. Due to the above symmetrical construction and movement of the pivot arms 59 and 60, below only the design of the first cranked pivot arm 59 will be described. On the first cranked area 62 of the first cranked pivot arm 59, three raising plates 64, 65, 66 are mounted turnably about their respective axes. By means of turning motors 67, 68, 69 the raising plates 64, 65, 66 can be turned to the starting position shown in Fig. 7, where they are adapted to be out of engagement with a cover element and the engagement position shown in Figs. 8 to 10, where they are adapted to be in engagement with the side section areas of a cover element. Furthermore, the raising plates 64, 65, 66 are substantially placed in a common plane. Correspondingly, the raising plates of the second pivot arm are also placed substantially in a common plane. Moreover, the pivot arms 59, 60 are formed such that the extreme points of the raising plates 64, 65, 66, which are placed on said pivot arms, in their engagement position substantially lie in a row which coincides with the axis 58, 61 of the respective pivot arm 59, 60, such as shown in Fig. 8.

**[0032]** The pivot arms 59, 60 are synchronously pivotal between the first position pivoted towards each other and shown in Fig. 7, where the raising plates 64, 65, 66 of the first pivot arm 59 substantially lie in the same plane as the raising plates of the second pivot arm 60, and a second position pivoted away from each other, which is shown in Figs. 8 to 10. In the second position, the pivot arms are pivoted at least so much outwards that the planes, in which their respective raising plates lie, at least are substantially parallel. Preferably, however, the pivot arms in the second position are pivoted so much outwards that the mentioned planes extend slightly incliningly upwards and inwards.

**[0033]** As it appears clearly from Figs. 7, 8 and 10, the synchronous movement of the two pivot arms 59, 60 is effected by means of a synchronising mechanism 70 placed at each of the slides 52, 53. As can be seen from Figs. 7 and 8, said synchronising mechanism 70 consists of a block 71, which is placed slidably on a vertical guide 72, and which is movable in an upward and a downward direction by means of linear actuators 73, 74, and of connecting rods 75, 76, one end thereof being pivotally connected to the block 71 and the other end thereof being pivotally connected to the respective cranked pivot arm 59, 60.

**[0034]** Furthermore, the cover raising and affixing device 43 includes a spreading device 77, 78 placed on each slide 52, 53, as shown most clearly in Figs. 9 and 10. Referring to the spreading device 78 on the slide 53, each spreading device 78 includes a slidable element 79, which is slidable in an upward and a downward direction in relation to the slide 72 along vertical guides 80, 81, which are firmly attached to the slide 53. The sliding of the slidable element 79 is effected by means of a linear actuator 82.

**[0035]** Each spreading device 77, 78 further includes

a spreading plate 83, which is turnably mounted on a transverse axis 84 and which can be turned on said axis by means of a linear actuator 85.

**[0036]** Below, a method according to the invention is described with reference to the apparatus according to the invention shown in Figs. 4 to 10.

**[0037]** A bin 22 (only shown in Fig. 10) is conveyed into a central position in the apparatus by means of the bin support, which is formed as a conveyor 41. In connection herewith, or prior hereto, the movable gripping device 47 in the web pulling arrangement 42 pulls or has pulled the leading edge of the web 2 from the starting position to the delivering position, where the second gripping device 50 has gripped the leading edge of the web, and the movable gripping device 47 has moved back to the starting position and has here gripped the web. Subsequently, the cover raising and affixing device 43 is moved upwards along the guides 48, 49 until the raising plates 64, 65, 66 of the pivot arms 59, 60 abut the lower surface of the web 2 between the inwardly folded sidewall sections 10, 11, the raising plates 64, 65, 66 of the pivot arms 59, 60 being in their retracted starting position, and the pivot arms 59, 60 being in their first position pivoted towards each other, cf. Fig. 7.

**[0038]** Hereafter, the raising plates 64, 65, 66 of the first pivot arm 59 and the raising plates of the second pivot arm 60 are turned outwards and in between the inwardly folded sidewall section adjacent the cover element such as to engage with the inner side of the respective folded edge 12, 13 and further on to stretch the cover panel section 9 of the cover element in the transverse direction, cf. Fig. 7. Upon said outward turning of the raising plates 64, 65, 66 the outer raising plates 64, 66 are brought into engagement with the adjacent end seams 14, 15, 16, 17, also obtaining a stretching of the cover panel section of the cover material in the longitudinal direction.

**[0039]** After the cover element has been secured and stretched in the longitudinal and transverse direction by means of the raising plates 64, 65, 66, the web 2 is cut transversely to separate the cover element from the web, the movable gripping device 47 at the end having a grip of the leading edge of the remaining web.

**[0040]** At the following method step a raising of the cover is effected. This is done by synchronously turning the pivot arms 59, 60 outwards, i.e. away from each other to the position shown in Fig. 8. In this position the cover provided by the cover element has a greater dimension than the upper area of the bin, as a both longitudinal and transverse stretching of the cover panel of the cover and the encasing skirt is effected. To ensure that the cover end walls of the cover have been moved sufficiently far away from each other, the spreading devices 77, 78 may now be moved upwards with the spreading plates 83 in their inwardly turned position. The spreading plates 83 may subsequently be turned outwards for a further stretching of the cover in the longitudinal direction such as shown in Figs. 9 and 10.

**[0041]** Hereafter, the cover raising and affixing mechanism 43 is moved downwards until the cover panel of the cover abuts the upper edge of the bin and the skirt of the cover encases the upper area of the bin wall as shown in Fig. 10.

**[0042]** In this position the raising plates 64, 65, 66 are brought out of engagement with the circumferential wall of the cover 3 by turning them to their starting position. Alternatively or additionally the cover raising and affixing device 43 may be moved further downwards. Provided that the spreading devices 77, 78 have been used, of course they are also moved downwards, so that the spreading plates 83 are brought out of engagement with the skirt of the cover.

**[0043]** As a result of the above method step, and due to the flexibility of the cover 3, said cover, when released by the cover raising and affixing device, is brought into encasing and securing engagement with the upper area of the bin to close its upper open end.

**[0044]** In a finalising method step, the cover raising and affixing device 43 is moved upwards, and its pivot arms are turned inwards with a view to a new raising of a cover element and affixing of the cover provided hereby to a bin. Finally the bin, to which a cover has been affixed, is fed out of the apparatus by means of the bin support 41 formed as a conveyor.

**[0045]** Finally it is to be noted that the provision and application of the spreading devices 77 and 78 as well as the application of the middle raising plate 65 of the pivot arms 59, 60 is optional and may depend on the length and width of the cover element and as a result hereof also on the length and the width of the bin onto which the cover element is to be placed.

#### 35 List of reference numerals

#### [0046]

1	Cover element
2	Length of cover elements
l	Longitudinal direction
T	Transverse direction
3	Cover
4	Outer side
5, 6	Side edges
7, 8	End edges
9	Cover panel section
10, 11	End wall sections
12, 13	Folded edges
14, 15, 16, 17	Inclining end seams
18	Corner flap
19, 20	V-shaped weld seams
21	Separation line
22	Bin
23	Bottom
24, 25	Bin sidewalls
26, 27	Bin end walls
28	Circumferential wall

29	Upper edge
30	Dotted line
31	Cover panel
32, 33	Cover sidewalls
34, 35	Cover end walls
36	Skirt
37	Apparatus
38	Apparatus frame
39, 40	Frame walls
41	Bin support
42	Web pulling arrangement
43	Cover raising and affixing device
44	Web supply and feeding mechanism
45	Feeding roller
46	Pressure roller
47	First movable gripping device
48, 49	Guide
50	Stationary gripping device
51	Knife
52, 53	Slides
54, 55	Vertical guides
56, 57	Vertical guides
58	First axis
59	First cranked pivot arm
60	Second cranked pivot arm
61	Second axis
62	Cranked area of first pivot arm
63	Cranked area of first pivot arm
64, 65, 66	Raising plates
67, 68, 69	Turning motors
70	Synchronising mechanism
71	Block
72	Guide
73, 74	Linear actuator
75, 76	Connecting rod
77, 78	Spreading device
79	Slidable element
80, 81	Guide on slide
82	Linear actuator
83	Spreading plate
84	Transverse axis
85	Linear actuator

## Claims

1. Folded cover element (1), which can be raised to provide a cover (3) adapted to be placed on an open upper end of a bin (22), especially a substantially parallelepipedon formed bin including a bottom (23) as well as a pair of opposed bin sidewalls (24, 25) and a pair of opposed bin end walls (26, 27) extending from the bottom (23) and jointly forming a circumferential wall (28) with a substantially rectangular upper edge (29), said cover (3) in the raised condition including a substantially rectangular cover panel (31) as well as a pair of opposed cover sidewalls (32, 33) and a pair of opposed cover end walls (34, 35) ex-

tending from the cover panel (31) and jointly forming a circumferential skirt (36) adapted to be placed enclosingly around an upper area of the circumferential wall of the bin, **characterised in that** the cover element (1) is provided by folding a substantially rectangular sheet of a flexible, yielding plastic film with a longitudinal direction (l) and a transverse direction (t), an inner side and an outer side (4) as well as a pair of opposed side edges (5, 6) and a pair of opposed end edges (7, 8), and that the cover element (1) includes a cover panel section (9) and a pair of opposed side wall sections (10, 11), which are folded along respective folded edges (12, 13) extending parallel to the respective side edges of the opposed side wall section such as to abut the cover panel section (9), inner side facing inner side, and which at each opposed end are welded to the cover panel section (9), inner side facing inner side, along inclined end seams (14, 15, 16, 17), each of which extends incliningly from a starting point in or near the respective folded edges (12, 13) towards the adjacent end edge (7, 8) at an angle of substantially 45° to the folded edge (12, 13) concerned.

2. Cover element according to claim 1, **characterised in that** the inwardly folded opposed side wall sections (10, 11) substantially have the same width measured between the folded edge and the side edge, that the distance between the starting point of the inclining end wall seams (14, 15, 16, 17) and the adjacent side edge is substantially identical at the opposed ends, and that said distance preferably corresponds substantially to the width of the opposed side wall sections (10, 11).

3. Continuous web of a large number of cover elements (1) according to one or more of claims 1 to 2, the longitudinal direction (i) of the cover elements in said web extending in the longitudinal direction (L) of the web and the cover elements (1) being formed by a transverse separation of the web to form end edges of the cover elements.

4. Method for providing a cover element (1) from a continuous web according to claim 3 and raising said cover element to provide a cover (3) as well as placing it on the upper open end of a bin (22), said method comprising the following steps:

- a) providing a bin (22) and placing hereof on a bin support (41),
- b) providing a continuous web (2) of cover elements,
- c) in a level above the bin (22) gripping the leading edge of the web (2) with a first movable gripping device (47) in a starting position hereof, the inwardly folded side wall sections (10, 11) of the cover elements of to the web facing the bin (22),

d) moving the first movable gripping device (47) above the bin so that a length of the web substantially corresponding to a length of the cover element is placed above the bin (22) and aligned in relation to said bin,

e) gripping the leading edge of the web with a second gripping device (50) and subsequently opening the first gripping device (47) so that it releases the leading edge of the web,

f) moving the first gripping device (47) back to its starting position and there gripping the web (2).

g) by a vertical relative movement of a first pair and a second pair of raising plates (64, 65, 66) in relation the web making the raising plates about the lower side of the web between the inwardly folded side wall sections,

h) stretching the film in the longitudinal and transverse direction by moving the first pair of cover raising plates (64, 65) outwardly in the longitudinal and the transverse direction and in between the one inwardly folded sidewall section (10) and the cover panel section (9) to engage with the inner side of the folded edge (12) and each respective end seam while simultaneously moving the second pair of cover raising plates outwardly in the transverse and longitudinal direction and in between the second inwardly folded sidewall section (11) and the cover plate section (9) to engage with the inner side of the folded edge (13) and each respective end seam,

i) transversely cutting of the web on the leading side of the first gripping device (47) as seen in the feeding direction of the web, so that a cover element is cut off the web and the first gripping device (47) grips the leading edge of the remaining web.

j) raising the cover element to provide the cover, the first pair of cover raising plates (64, 65, 66) turning outwardly around a first pivotaxis (58), which preferably is substantially merging with the one folded edge, and the second pair of cover raising plates simultaneously turning outwardly around a second pivotaxis (61), which preferably is substantially merging with the second folded edge,

k) by a vertical relative movement of the first and the second pair of cover raising plates (64, 65, 66) in relation to the bin making the skirt of the cover enclosing the upper area of the bin wall and preferably also making the cover panel about the upper edge of the bin,

l) bringing the cover raising plates (64, 65, 66) out of engagement with the enclosing wall of the cover, whereby the cover due to its flexibility tightly encloses with the upper area of the circumferential wall of the bin.

5. Method according to claim 4, **characterised in that** the vertical relative movement of the first and the second pair of the cover raising plates (64, 65, 66) in relation to the web mentioned in step g) is provided by a vertical upwardly movement of the pairs of cover raising plates.

6. Method according to claim 4 and/or 5, **characterised in that** the longitudinal and transverse movements of the first and the second pair of cover raising plates (64, 65, 66) mentioned in step h) are effected by turning the respective cover raising plates about their respective axes.

7. Method according to one or more of claims 4 to 6, **characterised in that** the relative movement of the first and the second pair of cover raising plates (64, 65, 66) in relation to the bin (22) mentioned in step k) is effected by a vertical downwardly movement of the cover raising plates.

8. Method according to one or more of claims 4 to 7, **characterised in that** the cover raising plates in step l) are brought out of engagement with the skirt of the cover by a turning of said cover raising plates and/or by moving each pair of cover raising plates downwards.

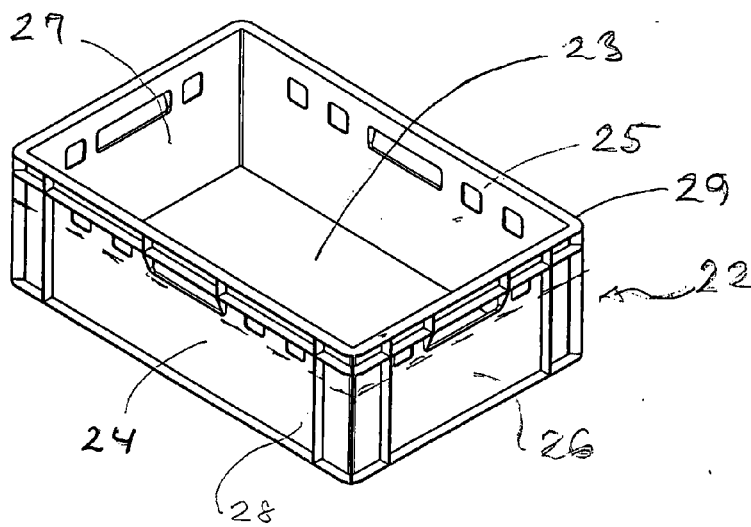
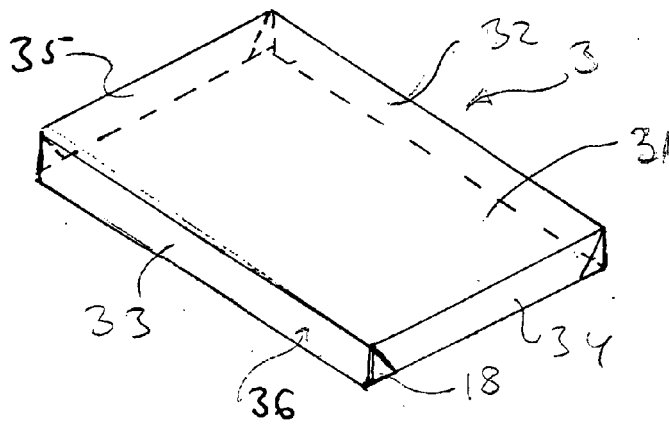
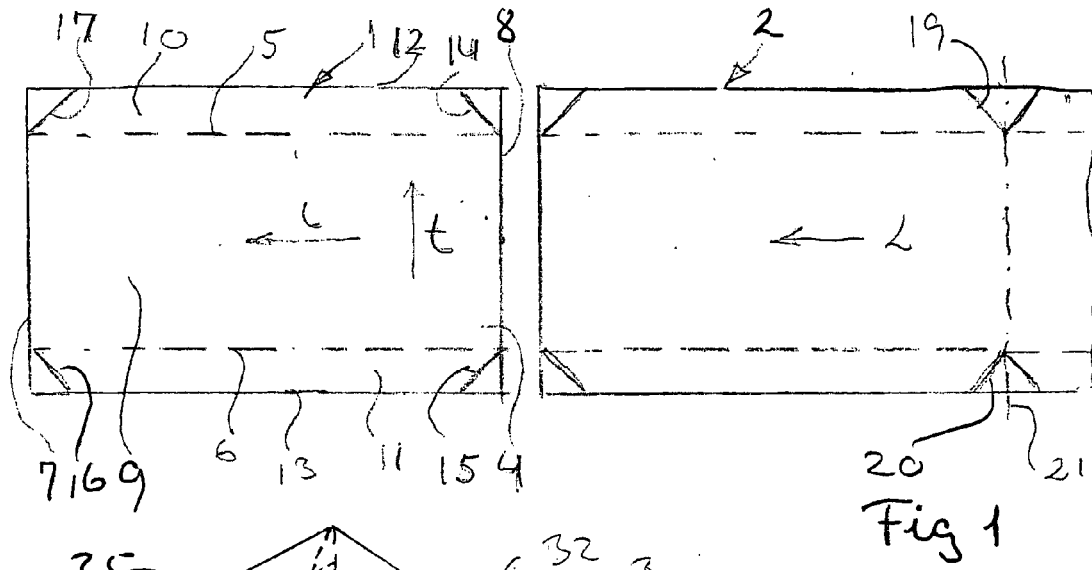
9. Apparatus for providing a cover element (1) from a continuous web according to claim 3, raising said cover element to provide a cover (3) and affixing said cover to the open end of a bin (11), **characterised in that** the apparatus (37) includes:

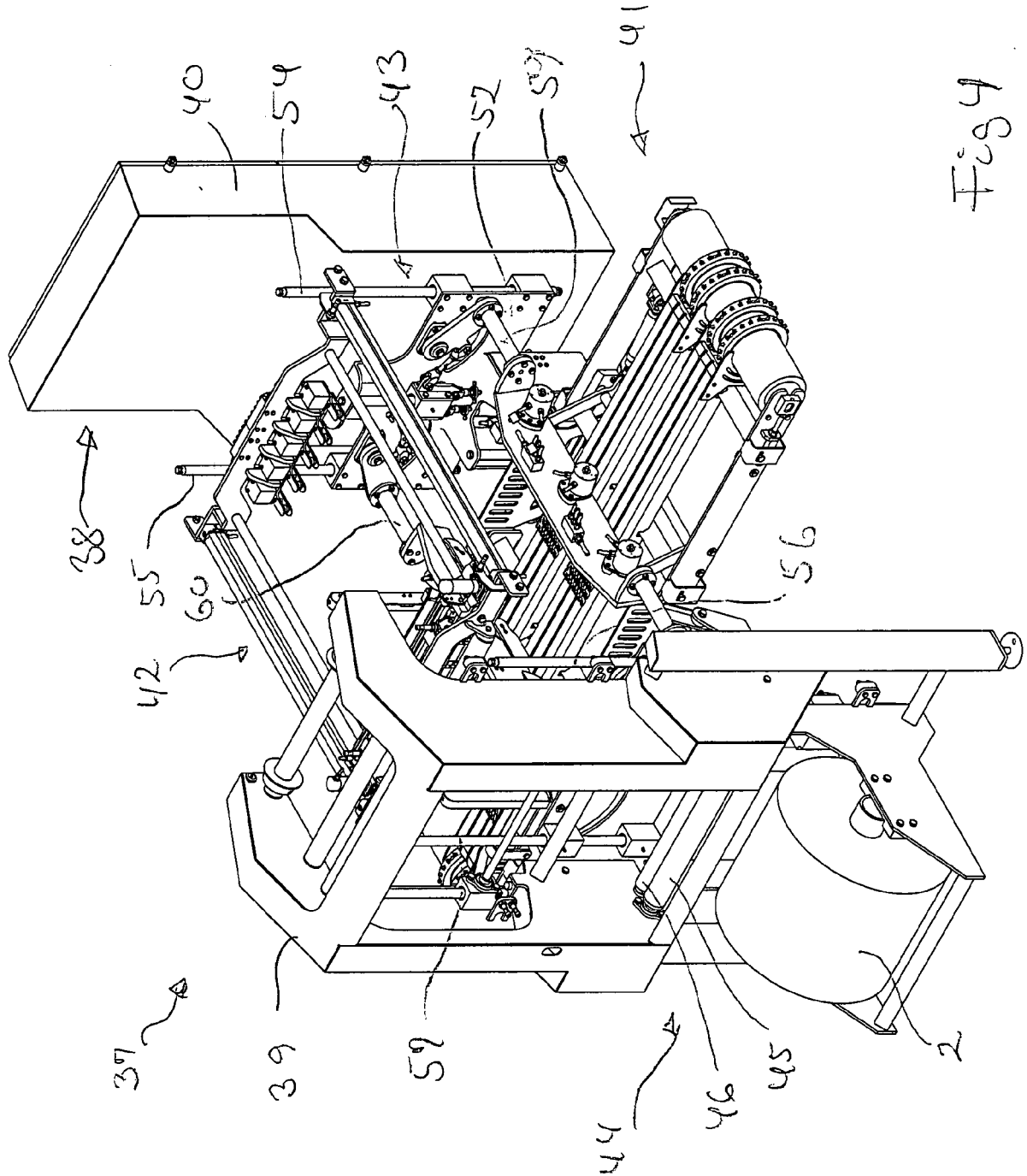
- an apparatus frame (38),
- a bin support (41) arranged in the apparatus frame (38) for supporting the bin (22),
- a web pulling arrangement (42) placed above the support (41) including a first movable gripping device (47), which is movable along horizontal guides (48, 49) from a starting position to a delivery position, placed at a distance from the starting position of the first gripping device (47) substantially equalling the length of a cover element (1) of the web (2), a second stationary gripping device (50) placed at the delivery position of the first gripping device (47) as well as a knife (51) placed at the starting position of the first gripping device (47) for a transverse cutting of the web.
- a cover raising and affixing device (43) placed between the support (41) and the web pulling arrangement (42), said cover raising and affixing device being placed vertically movable in the frame, and including a first cranked pivot arm (59) with a first cranked area (62), on which in a common first plane a first pair of cover raising plates (64, 65, 66) is placed movably, and a sec-



ond cranked pivot arm (60) with a second cranked area (63), on which in a common second plane a second pair of raising plates is mounted movably, said pivot arm (59, 60) being mounted turnably about a first and a second pivotaxis (58, 61) respectively, between a first position facing each other, where the first plane is substantially coinciding with the second plane, and a second position turning away from each other, where the first and the second plane are parallel or extending slightly incliningly upwardly and inwardly in relation to each other, said pair of movable raising plates (64, 65, 66) being movable between a retracted starting position, where they are adapted to be out of engagement with the cover element, and an extended position, where they engage with the cover element for stretching said cover element in the longitudinal and transverse direction.

10. Apparatus according to claim 9, **characterised in that** the movable raising plates (64, 65, 66) of the first pivot arm (59) and the movable raising plates of the second pivot arm (60) are mounted pivotally about respective axes on the respective pivot arm for a turning movement between the retracted starting position and the extended engagement position.





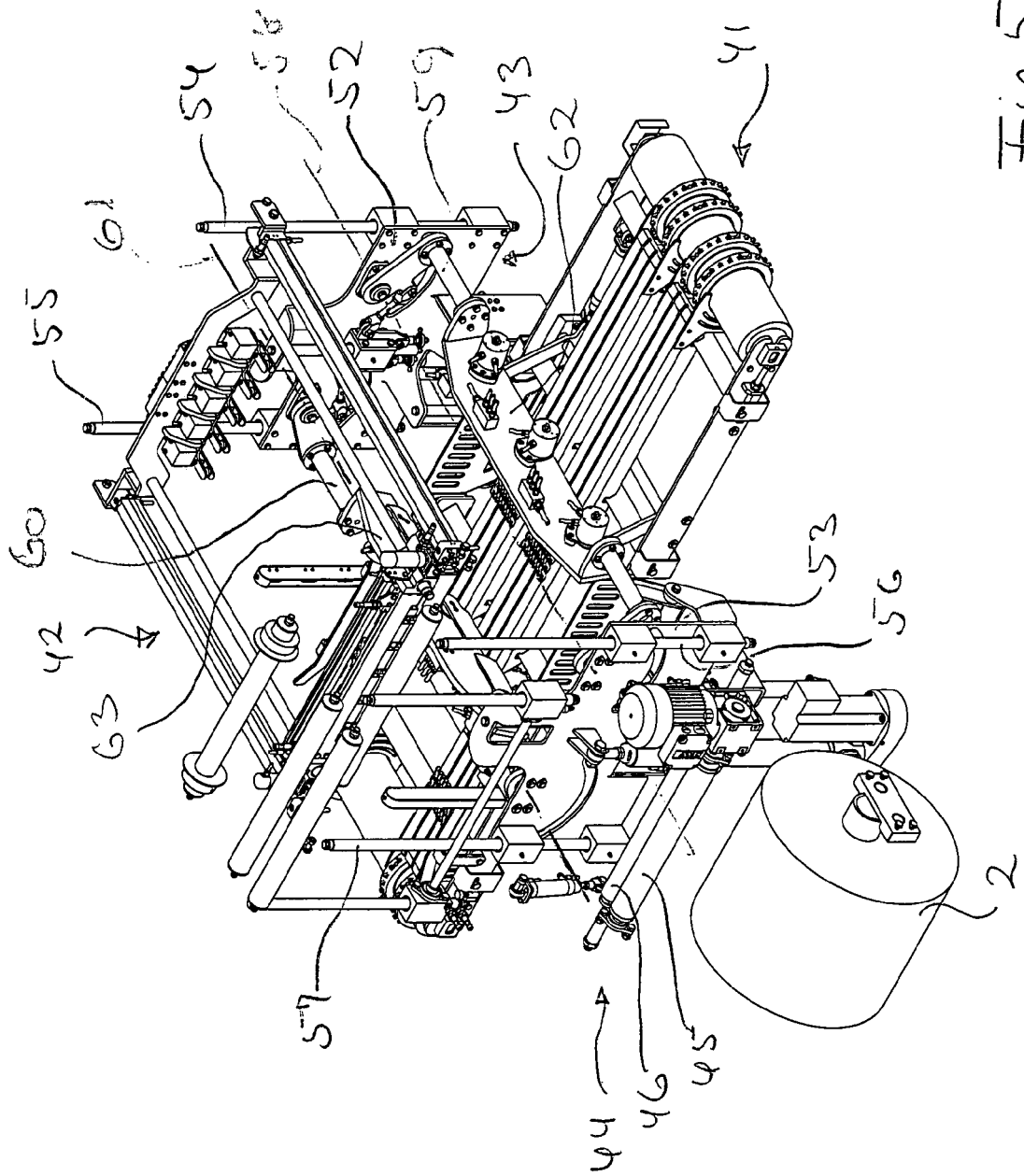


Fig 5

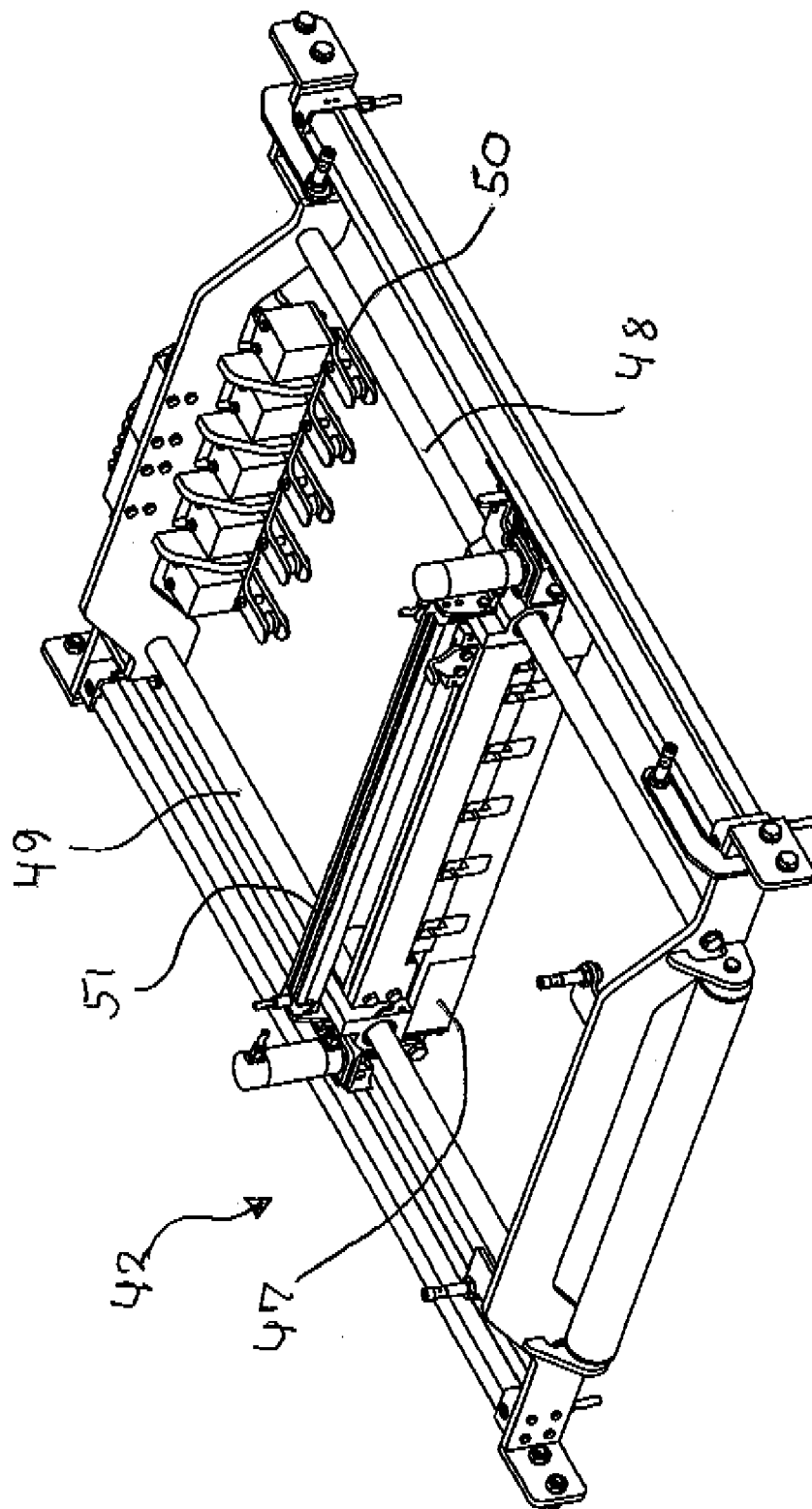
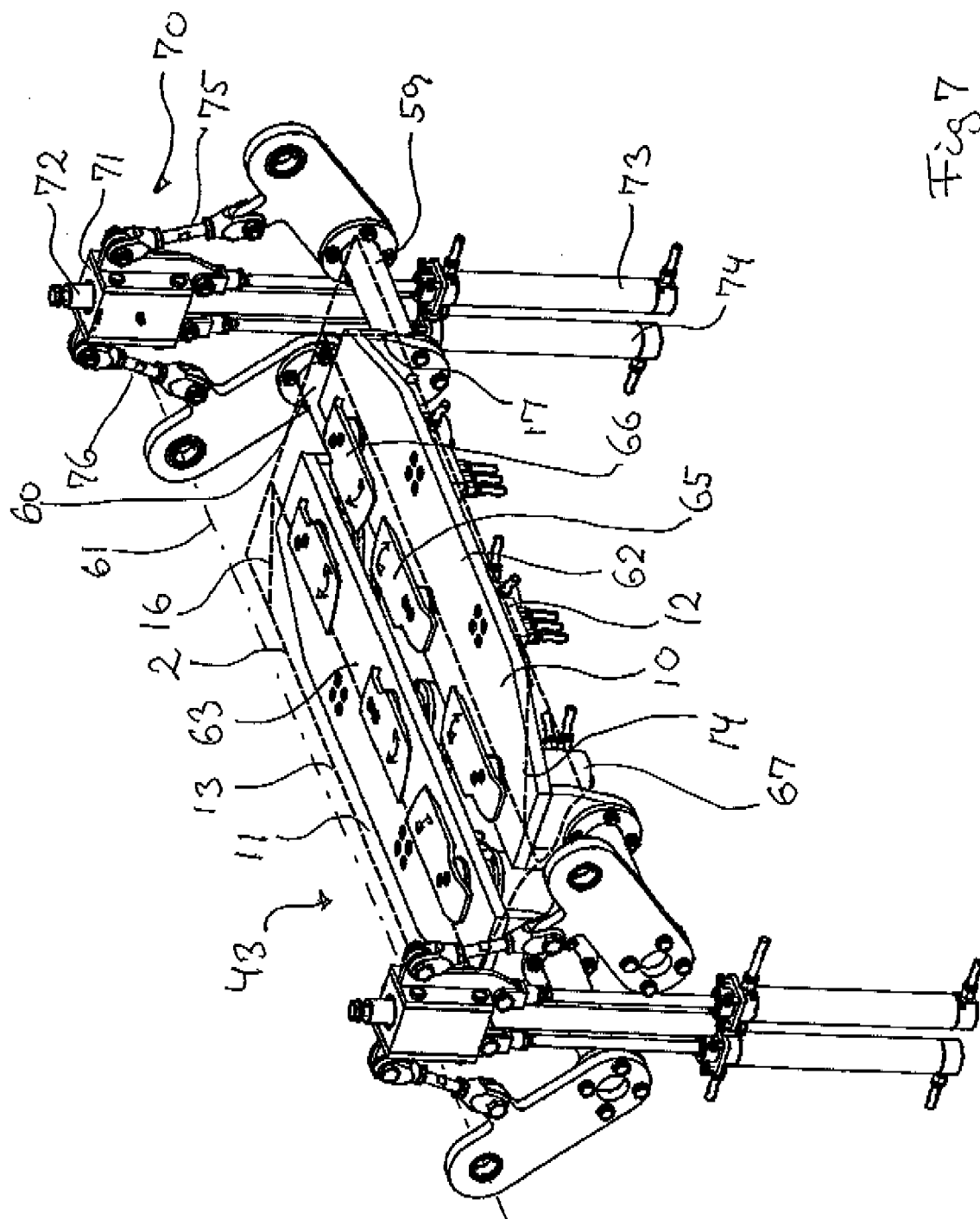
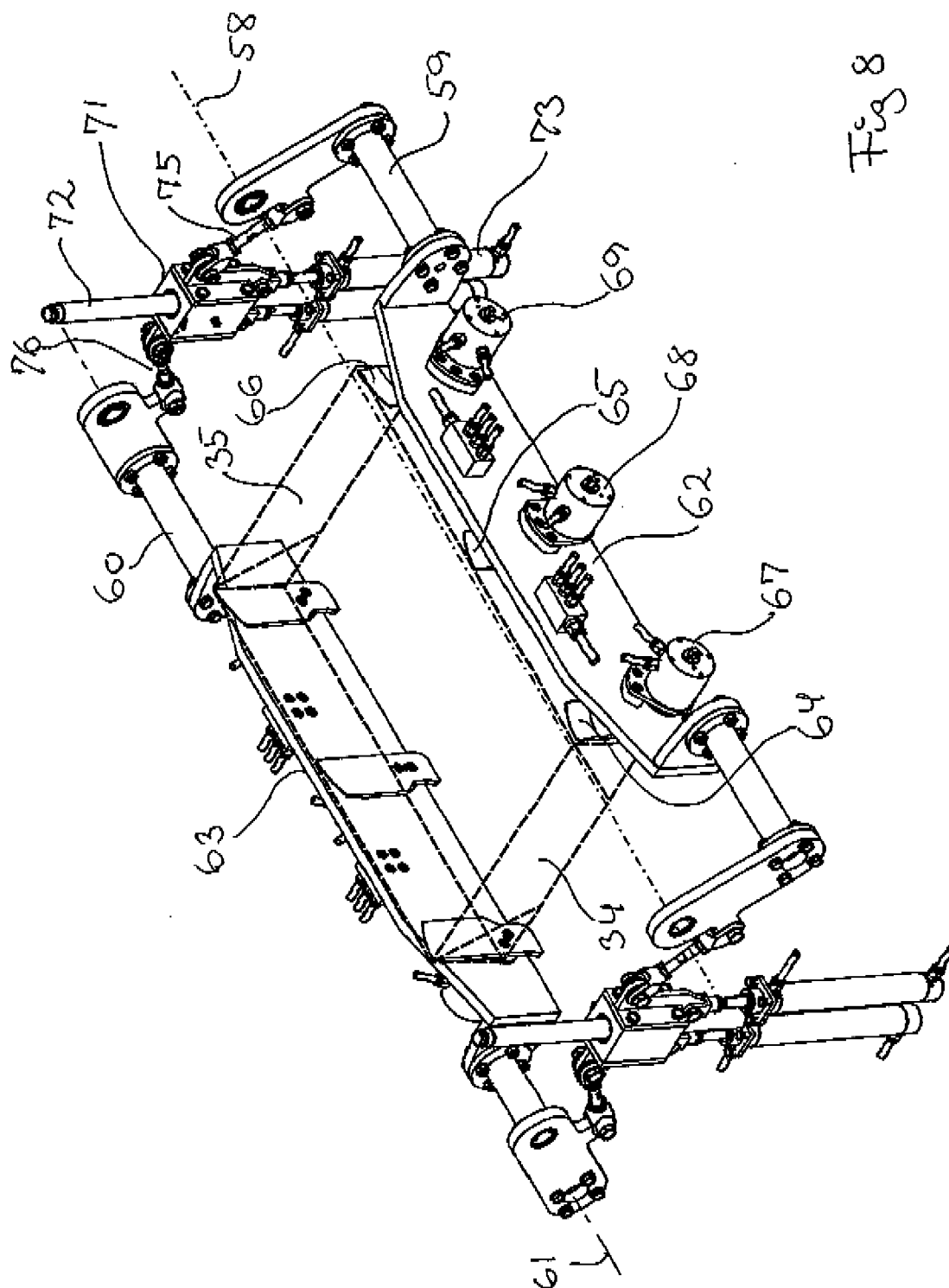


Fig 6



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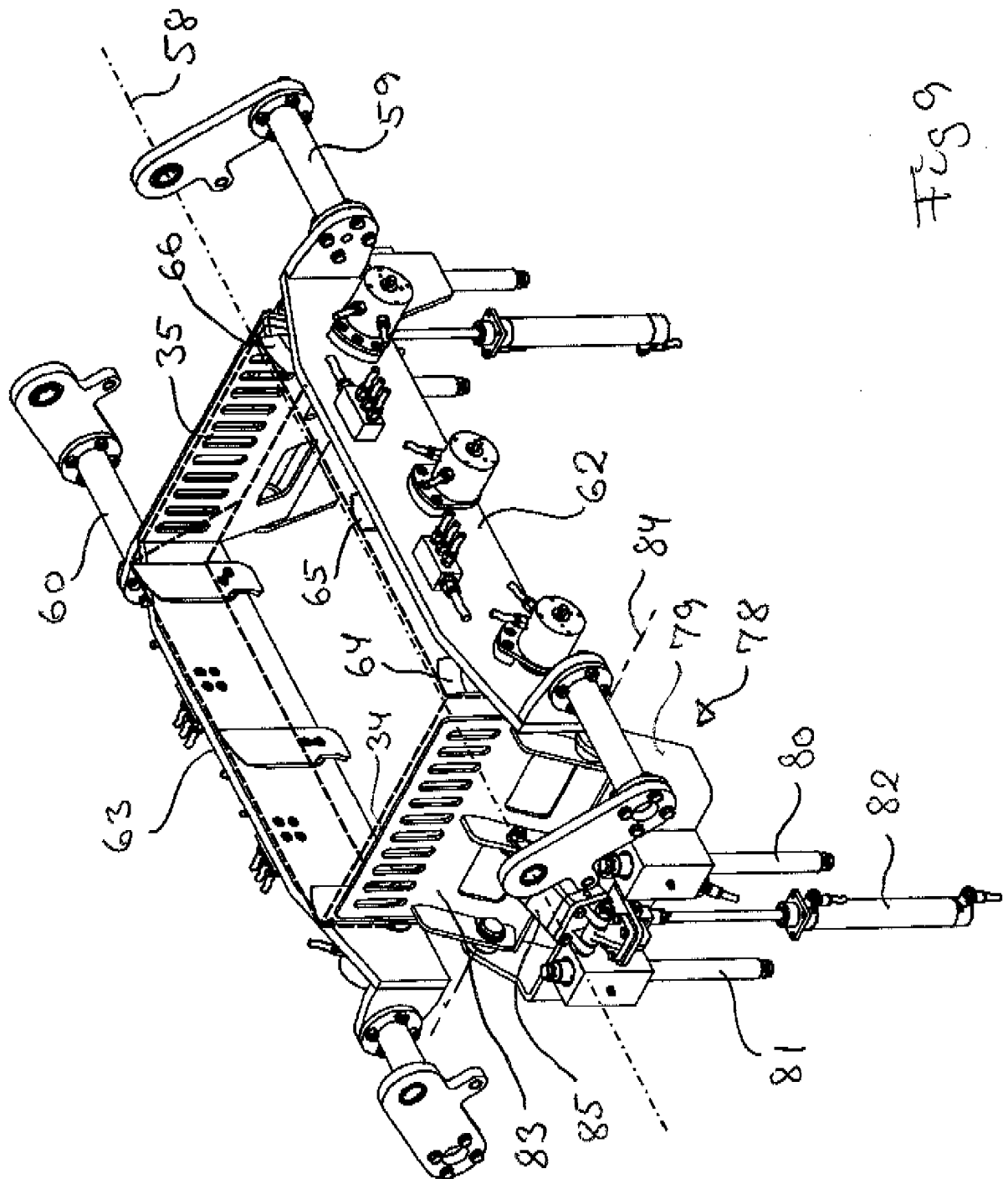


Fig 9



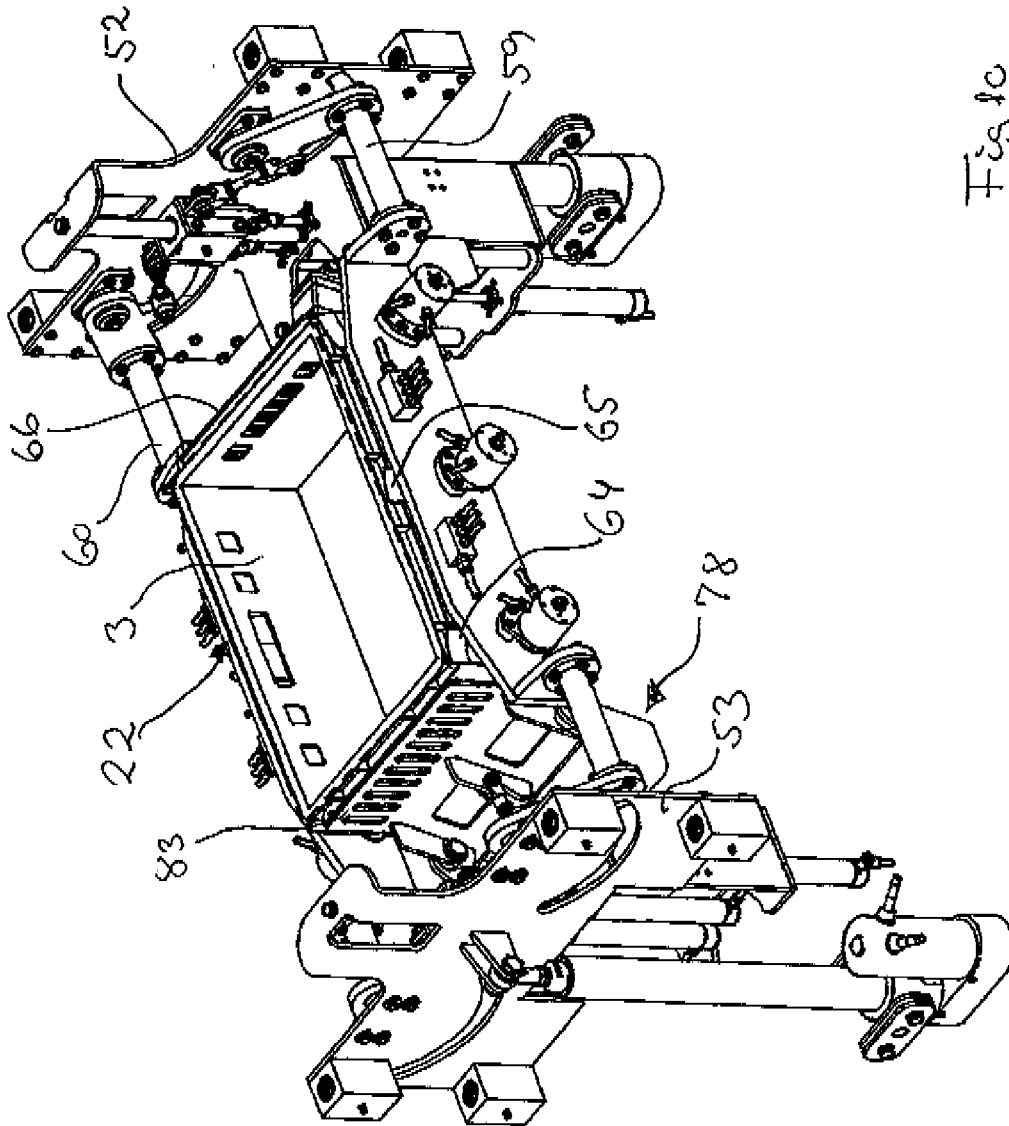


Fig. 10



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 07 38 8068

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			B65B B31D B31B B65H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 30 November 2007	Examiner Philippon, Daniel
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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 &amp; : member of the same patent family, corresponding document</p>			

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