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ABSTRACT

5 An assembly for dispensing cable from a spool, including first and second end members separated by one or more cross-members; and an axle extending at least partially between the end members for rotatably coupling the spool to the assembly, wherein end sections of the cross-members are releasably coupled to respective keyed slots of the end members.

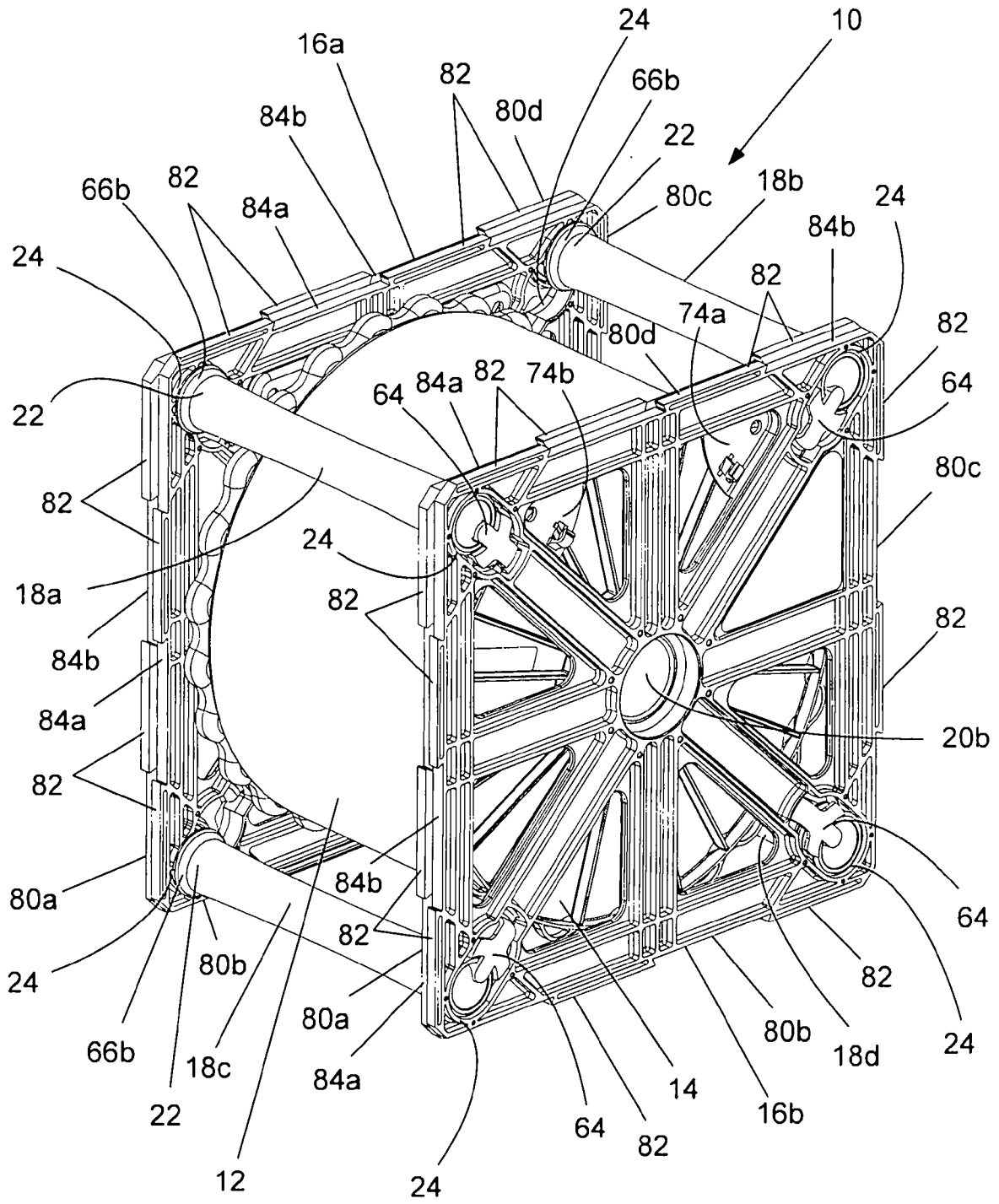


Figure 1

ASSEMBLY FOR DISPENSING CABLE

Technical Field of the Invention

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The present invention relates to an assembly for dispensing cable.

Background of the Invention

10 A number of systems have been developed to package and dispense wound flexible media (hereafter referred to as cable). For example, spools of cable have previously been packaged in cardboard boxes with internal plastic supports for rotatably mounting the spools. Cardboard cartons permit cable to be removed from the front of the box, for example. However, the cardboard packaging does not typically permit the spool to be
15 viewed as cable is being dispensed and, consequently, the operator may not be able to see how the cable is feeding off the spool. In addition, the packaging may not lend itself to easy handling and manoeuvring in environments with limited space, for example.

A further difficulty with the cardboard packaging is that it may not be sufficiently strong to
20 support the weight of the same product stacked on top of it. This may be a problem when it is desirable to draw cable from multiple packages. For example, in an installation where bundles of up to 12 cables are being installed, the cartons are typically stacked in a 3 x 4 configuration. In this configuration, the cardboard packages can be quite unstable when the cable is pulled off the spools at the same time. Extra means are usually needed to
25 make the stack of packages stable during such an operation. Further, the cardboard packaging may not be sufficiently strong to permit palletisation.

Other dispensing systems have been developed with a view to overcoming the above described difficulties. For example, US 6,523,777 teaches, with reference to Figure 1, a
30 portable wire spool caddy that includes a frame (12) with end plates (14, 16) separated by rectangular supporting members (18, 20). The caddy is shaped to house a reel (42)

between the support members (18, 20) and the plates (14, 16) in a manner that permits the reel (42) to spin as cable is drawn therefrom. The caddy also includes a swing (80) and bracket (54) which is adapted to bear against the reel (42) and function as a brakeing mechanism. The wire spool caddy taught by US 6,523,777 may provide a useful device
5 for generally dispensing cable. However, the wire spool caddy may not facilitate easy assembly and disassembly for transportation and storage. Further, US 6,523,777 may not provide a mechanism that can tie-off an end of the cable and stop the reel (42) from rotating due to inertia during transportation.

10 Similarly, US 5,967,451 teaches a carrier for carrying one or more wire spools. With reference to Figure 1 of US 5,967,451, the carrier includes end plates (26, 28) connected by a central rod (20), connecting rods (48, 50) and handle (46). The carrier includes a semicircular cradle (24) arranged to support the wire spools (12, 14) and to protect them
15 from "free wheeling" in which the spools continue to spin after the user has ceased pulling the wire from the spools. The cradle (24) includes a number of slots (36), one for each spool, through which wire is drawn from the spools (12, 14). The cradle taught by US 5,967,451 may provide a useful device for generally dispensing cable. However, the cradle may not facilitate easy assembly and disassembly for transportation and storage. Further, US 5,967,451 may not provide a mechanism that can stop the wire spool (12, 14)
20 from rotating due to inertia during transportation, for example.

It is generally desirable to overcome or ameliorate one or more of the above mentioned difficulties, or at least provide a useful alternative.

25 Summary of the Invention

There is provided a spool assembly for dispensing cable comprising: (a) a spool for receiving a length of cable, including: (i) a drum comprising first and second parts; and
30 (ii) two flanges couplable to respective opposed end sections of said drum, the flanges having fluted outer peripheral edge sections that define alternating peaks and troughs, the

peaks defining a first diameter of the spool and the troughs defining a second diameter of the spool, said end sections of the drum mate with locking sections of the flanges when the parts of the drum are coupled together; (b) an assembly including first and second end members separated by one or more cross-members and an axle extending at least partially
5 between the end members that rotatably couples the spool to the assembly, each of the first and second end members having an inner side facing the spool and an outer side facing away from the spool, the first end member including a tie off section that defines an aperture extending between the outer and inner sides and sized to receive the cable, the tie off section also including a retainer disposed at the outer side of the first end member at the
10 aperture, the aperture being aligned between the first and second diameters of the spool so that the cable would settle into one of the troughs of the fluted outer peripheral edge sections if routed from the spool, through the aperture, to the retainer, thereby inhibiting rotation of the spool with respect to the first and second end members.

15 It is preferable that the first and second parts of the drum are concavely shaped and releasably couple together.

It is preferable that opposite end sections of the drum are open and include inner peripheral ledges shaped to fit over corresponding outer peripheral ledges of the locking sections of
20 the flanges.

Preferably, the outer peripheral ledges of the locking sections are castellated with projections.

25 It is preferable that the locking sections include locking keys that extend into corresponding slots of the open end sections of the drum to inhibit rotation of the drum with respect to the flanges.

The drum preferably includes a slot shaped to receive an end section of the length of cable
30 to enable spooling to start.

It is preferable that one or both of the flanges include an outer slot shaped for engagement with a drive dog.

Preferably, the first and second parts of the drum are coupled together with a fastener.

5

The fastener can preferably include male and female interlocking clips located on respective sections of the first and second parts.

It is preferable that end sections of the cross-members are releasably coupled to respective
10 keyed slots of the end members.

Preferably, the keyed slots each include: (i) a receiving section for receiving the end
section of a respective one of said cross-members; (ii) a locking section spaced from the
receiving section, the locking section being shaped to receive said end section from the
15 receiving section and to inhibit movement of the respective cross-member in a lengthwise
axial direction of the cross-member; and (iii) a key extending over the receiving section
for inhibiting movement of the respective cross-member from the locking section towards
the receiving section.

20 It is preferable that the end sections of the cross-members resiliently deflect keys of the
keyed slots when seated in the receiving sections.

Preferably, the distal end sections of the keys include pairs of locking members, each pair
of said pairs being shaped to receive an open end section of a respective one of said end
25 sections of the cross-members therebetween.

The pairs of locking members preferably resiliently separate to accommodate said open
end section.

30 It is preferable that the pairs of locking members of the keys inhibit movement of the
cross-members towards corresponding receiving sections of the keyed slots.

Preferably, the first and second end members are generally planar surfaces defined by four sides.

- 5 The assembly can include a common series of raised locking members staggered alternatively between inner and outer sections of each side of the first and second members.

- 10 The assembly can also include a common series of locking member receiving sections staggered alternatively between outer and inner sections of each side of the first and second members.

Preferably, the locking members inhibit movement of the assembly in four directions.

- 15 It is preferable that the locking members include angled articular ends of mating with angled articular ends of locking members of another corresponding assembly.

Brief Description of the Drawings

- 20 Preferred embodiments of the present invention are hereafter described, by way of non-limiting example only, with reference to the accompanying drawing in which:

Figure 1 is a front perspective view of an assembly for dispensing cable;

Figure 2 is a partially exploded view of the assembly shown in Figure 1;

- 25 Figure 3 is a front perspective view of a spool of the assembly shown in Figure 1;

Figure 4 is a front perspective view of the spool shown in Figure 3 with a part of the drum removed;

Figure 5 is a front perspective view of a drum of the spool shown in Figure 3;

- 30 Figure 6 is a front perspective view of a plurality of parts of the drum shown in Figure 5 stacked on top of one another;

Figure 7 is a side view of the stack of parts shown in Figure 6;

Figures 8a to 8d are enlarged views of a section of the assembly shown in Figure 1 arranged in different conditions of use;

Figure 9 is an enlarged view of another section of the assembly shown in Figure 1 arranged in a condition of use;

5 Figure 10 is another enlarged view of the section of the assembly shown in Figure 9;

Figure 11 is a front perspective view of the assembly shown in Figure 1 being stacked on top of another assembly;

Figure 12 is a front perspective view of the assembly shown in Figure 1 stacked on top of another assembly; and

10 Figure 13 is an enlarged view of section "Z" of the stacked assemblies shown in Figure 12.

Detailed Description of Preferred Embodiments of the Invention

The assembly 10 shown in Figures 1 and 2 is used to dispense cable 12, for example, from
15 a spool 14. The assembly 10 includes first and second end members 16a, 16b separated by
four cross-members 18a, 18b, 18c, 18d. Alternatively, the assembly 10 can have one or
more cross-members 18a, 18b, 18c, 18d. The assembly 10 also includes an axle 20
extending at least partially between the end members 16a, 16b for rotatably coupling the
20 spool 14 thereto. Preferably, the axle 20 is formed in two axially aligned parts 20a, 20b
that extend towards each other from respective opposed sides of the end members 16a,
16b. End sections 22 of the cross-members 18a, 18b, 18c, 18d are releasably coupled to
respective keyed slots 24 of the end members 16a, 16b.

As particularly shown in Figures 3 to 7, the spool 14 includes a drum 26 comprising first
25 and second parts 28a, 28b; and two flanges 30a, 30b couplable to respective opposed end
sections 32 of the drum 26. The drum 26 is preferably a cylindrical tube formed when the
two concave parts 28a, 28b are coupled together in the manner shown in Figure 5. The
parts 28a, 28b are coupled together by a fastener 34. The fastener 34 preferably includes
30 four pairs of male and female interlocking clips 34a, 34b that snap closed as the parts 28a,
28b are fitted together. The male and female interlocking clips 34a, 34b are releasably
couplable together so that the spool 14 can be disassembled.

As particularly shown in Figures 6 and 7, the parts 28a, 28b of the spool 14 preferably have the same shape and configuration. To this end, opposed elongate sides 36a, 36b of each part 28a, 28b of the drum 26 each include projecting portions of a male clip 34a and a female clip 34b. In this arrangement, corresponding male and female clips 34a, 34b interlock when the parts 28a, 28b of the drum 26 are fitted together in the manner shown in Figure 5.

The first and second parts 28a, 28b of the drum 26 are semi circular in a lengthwise axial L_{ADD} cross-section so that the drum 26 is circular in a lengthwise axial L_{ADD} cross-section when the parts 28a, 28b are coupled together.

As particularly shown in Figures 4 and 5, opposite end sections 32 of the cylindrical drum 26 are open and include inner peripheral ledges 38 shaped to fit over corresponding outer peripheral ledges 40 of circular locking sections 42a, 42b of the flanges 30a, 30b. The outer peripheral ledges 40 of circular locking sections 42a, 42b preferably castellated with projections 43.

The circular locking sections 42a, 42b each include a pair of locking keys 44a, 44b that are positioned to fit into slots 46a, 46b formed between the parts 28a, 28b of the end sections 32 of the drum 26. The flanges 30a, 30b include indicia 48 marking the position of the keys 44a, 44b.

The spool 14 is assembled by performing the following steps:

25

- a. the second part 28b of the drum 26 is coupled to the locking sections 42a, 42b of opposed flanges 30a, 30b so that:
 - i. the ledges 38 of the end sections 32 of the second part 28b are fitted over the ledges 40 of the locking sections 42a, 42b; and
 - 30 ii. the pairs of keys 44a, 44b are seated in the slots 46a, 46b of the second part 28b;

- b. the first part 28a of the drum 26 is coupled to the locking sections 42a, 42b of opposed flanges 30a, 30b so that:
- i. the ledges 38 of the end sections 32 of the first part 28a are fitted over the ledges 40 of the locking sections 42a, 42b; and
 - 5 ii. the pairs of keys 44a, 44b are seated in the slots 46a, 46b of the first part 28a; and
- c. interconnecting the male and female clips 34a, 34b of the first and second parts 28a, 28b together so that the drum 26 locks around the locking sections 42a, 42b of the flanges 30a, 30b.

10

The locking sections 42a, 42b are keyed to inhibit rotation of the drum 26 with respect to the flanges 30a, 30b.

The locking sections 42a, 42b of the flanges 30a, 30b include profiled bearing surfaces 50 15 shaped to fit over respective sections 20a, 20b of the axle 20. These profiled bearing surfaces 50 reduce friction, and resulting heat, between the surfaces 20, 50 as they articulate over each other. The profiled bearing surfaces 50 also allow any dust, or plastic material that is abraded from the bearing surfaces 50, to be immediately isolated away from the articulating surfaces 20, 50.

20

Outer peripheral edge sections 52 of the flanges 30a, 30b are fluted with peaks 54a and troughs 54b. One or both of the flanges 30a, 30b include an outer slot 58 shaped for engagement with a drive dog (not shown) for spooling cable onto the spool 14 before installation on the assembly 10.

25

As particularly shown in Figures 8a to 8d, the keyed slots 24 of the first and second end members 16a, 16b each include:

- 30 (a) a receiving section 60 shaped to receive an end section 22 of the cross-member 18a;
- (b) a locking section 62 being shaped to receive the end section 22 from the receiving

section 60 and to inhibit movement of the cross-member 18a in a lengthwise axial direction D_{LA} of the cross-member 18a; and

- (c) a key 64 extending over the receiving section 62 for inhibiting movement of the cross-member 18a from the locking section 62 towards the receiving section 60.

5

The keys 64 are preferably coupled to the receiving sections by arms 65. Alternatively, the key 64 extends over the locking section 62 and inhibits movement of the cross-member 18a from the locking section 62 towards the receiving section 60.

- 10 End sections 22 of the cross-members 18a, 18b, 18c, 18d include a pair of spaced apart locking flanges 66a, 66b extending radially with respect to a lengthwise axis D_{LA} of the cross-members 18a, 18b, 18c, 18d. The receiving sections 62 are shaped to receive end sections 22 of the cross-members 18a, 18b, 18c, 18d so that a first locking flange 66a is seated in the receiving section 60 and a second locking flange 66b abuts the receiving
- 15 section 60. As the cross-members 18a, 18b, 18c, 18d are pushed towards respective locking sections 62, the locking flanges 66a, 66b are located on either side of a locking surface 68 of the locking section 62. The locking sections 62 thereby inhibit movement of the cross-members 18a, 18b, 18c, 18d in a lengthwise axial direction D_{LA} .

- 20 Open end sections 72 of the cross-members 18a, 18b, 18c, 18d resiliently deflect keys 64 of the keyed slots 24 when seated in corresponding receiving sections 60. The end sections 72 of the cross-members 18a, 18b, 18c, 18d also resiliently deflect keys 64 of the keyed slots 24 when seated in corresponding locking sections 62.

- 25 Distal end sections of the keys include pairs of locking members 70a, 70b. The pairs of locking members 70a, 70b being shaped to receive the open end sections 72 of the cross-members 18a, 18b, 18c, 18d therebetween. The pairs of locking members 70a, 70b resiliently separate to accommodate open end 72 of the cross-members 18a, 18b, 18c, 18d therebetween. The pairs of locking members 70a, 70b of the keys 64 thereby inhibit
- 30 movement of the cross-members 18a, 18b, 18c, 18d towards corresponding receiving sections 60 of the keyed slots 24.

The assembly 10 includes tie off sections 74a, 74b that are used to tie off end sections of cable 12 and inhibit rotation of the spool 26 when the spool 26 is not in use. As particularly shown in Figures 9 and 10, the first and second members 16a, 16b each include two tie off sections 74a, 74b which each include an aperture 76 and a retainer 78. The end section of the cable 12 is threaded through the aperture 76 and secured to the tie off section 74a with the retainer 78. In doing so, the cable extends over the flange 30a and settles in a trough 54b of the fluted rim of the spool 14. Rotation of the spool 14 around the axle 20 is thereby inhibited.

10

The first and second members 16a, 16b are generally planar surfaces defined by four sides 80a, 80b, 80c, 80d. The assembly 10 includes a common series of raised locking members 82 staggered alternatively between inner and outer sections 84a, 84b of each side 80a, 80b, 80c, 80d of the members 16a, 16b. The assembly 10 therefore also includes a common series of locking member receiving sections 86 staggered alternatively between outer and inner sections 84b, 84a of each side 80a, 80b, 80c, 80d of the members 16a, 16b.

15

As particularly shown in Figures 11 to 13, the locking members 82 of a side 80a, 80b, 80c, 80d of the assembly 10 can be seated in the receiving section 86 of a side 80a, 80b, 80c, 80d of another assembly 10. The receiving sections 86 are preferably larger than the corresponding locking members 82 so that the locking members 82 can be easily seated therein when the assemblies are stacked. The locking members 82 include angled articular ends 88 for mating with corresponding angled articular ends 88 of locking members 82 of another corresponding assembly 10.

25

The locking members 82 preferably restrict four degrees of movement of the assembly 10 when stacked on another assembly.

Many modifications will be apparent to those skilled in the art without departing from the scope of the present invention

30

Throughout this specification, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

5

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that the prior art forms part of the common general knowledge in Australia.

10

List of Parts

	10	Assembly
	12	Cable
5	14	Spool
	16a, 16b	End member
	18a, 18b, 18c, 18d	Cross-member
	20	Axle
	22	End section
10	24	Keyed slot
	26	Drum
	28a, 28b	Part of drum
	30a, 30b	Flange
	32	End of drum
15	34a, 34b	Male and female clip
	36a, 36b	Side of part of drum
	38	Inner peripheral ledge
	40	Outer peripheral ledge
	42a, 42b	Locking section
20	43	Projection
	44a, 44b	key
	46a, 46b	Slot
	48	Indicia
	50	Profiled bearing surface
25	52	Outer peripheral edge section
	54a	Peak
	54b	Trough
	56	Aperture
	58	Aperture
30	60	Receiving section
	62	Locking section

	64	Key
	66a, 66b	Flange
	68	Locking surface
	70a, 70b	Locking member
5	72	Open end of cross-member
	74a, 74b	Tie off section
	76	Aperture
	78	Retainer
	80a, 80b, 80c, 80d	Side of member
10	82	Locking member
	84a, 84b	Inner and outer section of side of member
	86	Receiving section
	88	Angled articular surface

Claims Defining the Invention

1. A spool assembly for dispensing cable comprising:
- 5 (a) a spool for receiving a length of cable, including:
- (i) a drum comprising first and second parts; and
- (ii) two flanges couplable to respective opposed end sections of said drum, the flanges having fluted outer peripheral edge sections that define alternating peaks and troughs, the peaks defining a first diameter of the spool and the troughs
- 10 defining a second diameter of the spool,
- wherein said end sections of the drum mate with locking sections of the flanges when the parts of the drum are coupled together;
- (b) an assembly including first and second end members separated by one or more cross-members and an axle extending at least partially between the end members that
- 15 rotatably couples the spool to the assembly, each of the first and second end members having an inner side facing the spool and an outer side facing away from the spool, the first end member including a tie off section that defines an aperture extending between the outer and inner sides and sized to receive the cable, the tie off section also including a retainer disposed at the outer side of the first end member at the aperture, the aperture
- 20 being aligned between the first and second diameters of the spool so that the cable would settle into one of the troughs of the fluted outer peripheral edge sections if routed from the spool, through the aperture, to the retainer, thereby inhibiting rotation of the spool with respect to the first and second end members.
- 25 2. The spool assembly of claim 1, wherein the first and second parts of the drum are concavely shaped and releasably couple together.
3. The spool claimed in claim 1, wherein opposite end sections of the drum are open and include inner peripheral ledges shaped to fit over corresponding outer peripheral
- 30 ledges of the locking sections of the flanges.

4. The spool claimed in claim 3, wherein the outer peripheral ledges of the locking sections are castellated with projections.
5. The spool claimed in claim 3, wherein the locking sections include locking keys that extend into corresponding slots of the open end sections of the drum to inhibit rotation of the drum with respect to the flanges.
6. The spool claimed in claim 1, wherein the drum includes a slot shaped to receive an end section of the length of cable to enable spooling to start.
7. The spool claimed in claim 1, wherein one or both of the flanges include an outer slot shaped for engagement with a drive dog.
8. The spool claimed in claim 1, wherein the first and second parts of the drum are coupled together with a fastener.
9. The spool claimed in claim 8, wherein the fastener includes male and female interlocking clips located on respective sections of the first and second parts.
10. The spool claimed in claim 1, wherein end sections of the cross-members are releasably coupled to respective keyed slots of the end members.
11. The spool claimed in claim 10, wherein the keyed slots each include:
- (i) a receiving section for receiving the end section of a respective one of said cross-members;
 - (ii) a locking section spaced from the receiving section, the locking section being shaped to receive said end section from the receiving section and to inhibit movement of the respective cross-member in a lengthwise axial direction of the cross-member; and
 - (iii) a key extending over the receiving section for inhibiting movement of the respective cross-member from the locking section towards the receiving section.

12. The spool claimed in claim 11, wherein the end sections of the cross-members resiliently deflect keys of the keyed slots when seated in the receiving sections.

13. The assembly claimed in claim 12, wherein distal end sections of the keys include
5 pairs of locking members, each pair of said pairs being shaped to receive an open end section of a respective one of said end sections of the cross-members therebetween.

14. The assembly claimed in claim 13, wherein the pairs of locking members resiliently separate to accommodate said open end section.

10

15. The assembly claimed in claim 13, wherein the pairs of locking members of the keys inhibit movement of the cross-members towards corresponding receiving sections of the keyed slots.

15 16. The assembly claimed in claim 1, wherein the first and second end members are generally planar surfaces defined by four sides.

17. The assembly claimed in claim 16, including a common series of raised locking members staggered alternatively between inner and outer sections of each side of the first
20 and second members.

18. The assembly claimed in claim 17, including a common series of locking member receiving sections staggered alternatively between outer and inner sections of each side of the first and second members.

25

19. The assembly claimed in claim 17, wherein the locking members inhibit movement of the assembly in four directions.

20. The assembly claimed in claim 17, wherein the locking members include angled articular ends of mating with angled articular ends of locking members of another
30 corresponding assembly.

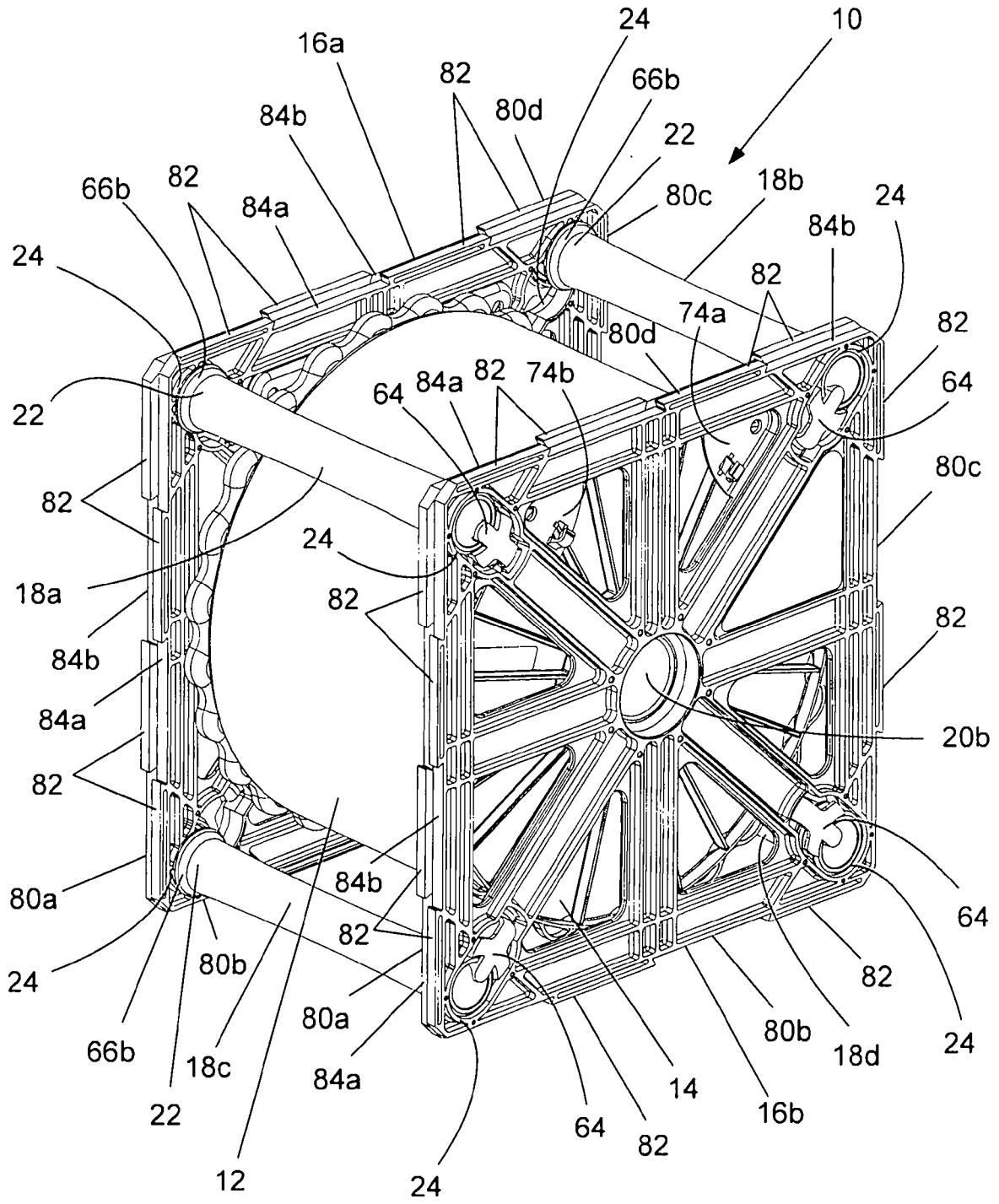


Figure 1

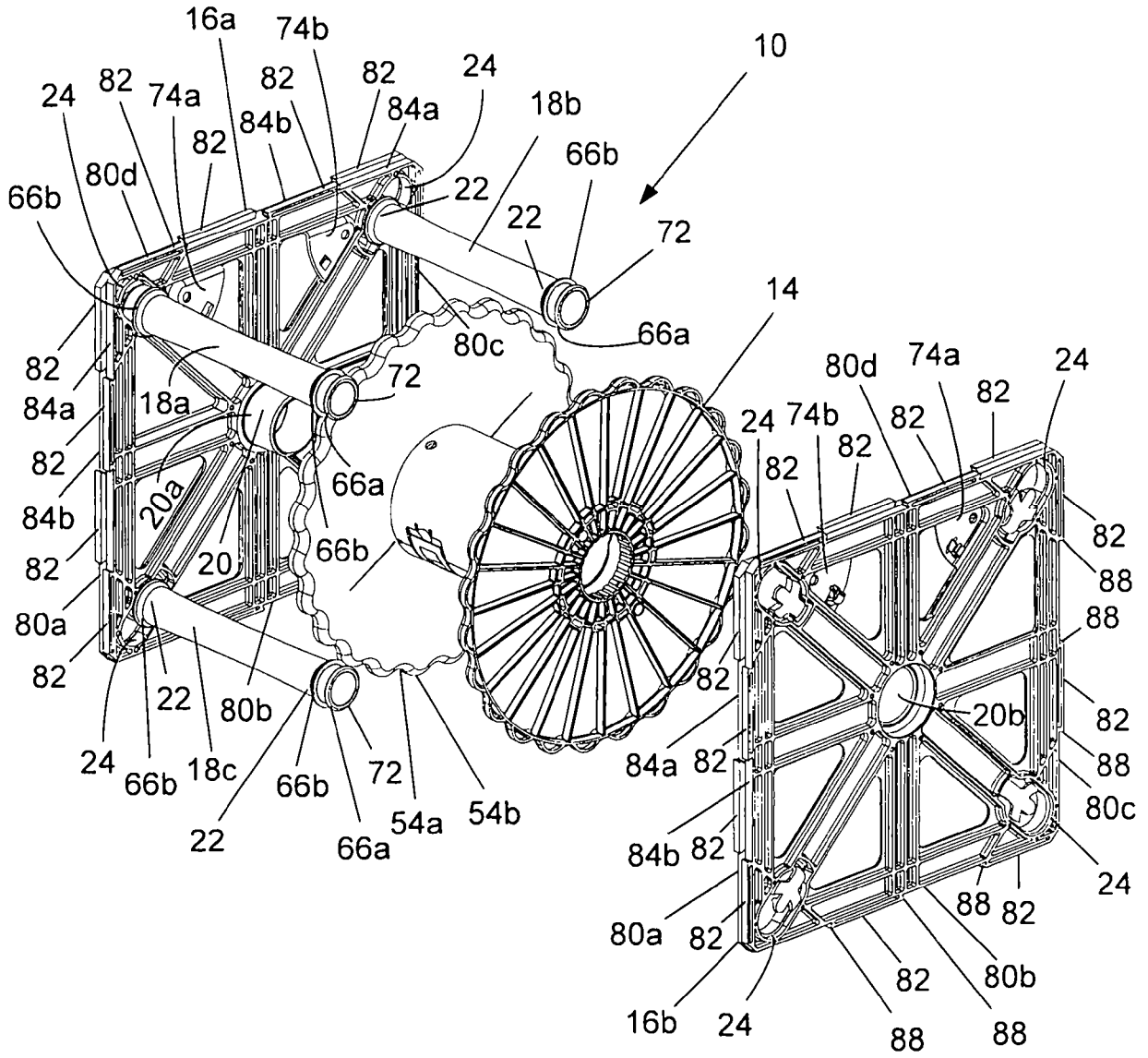
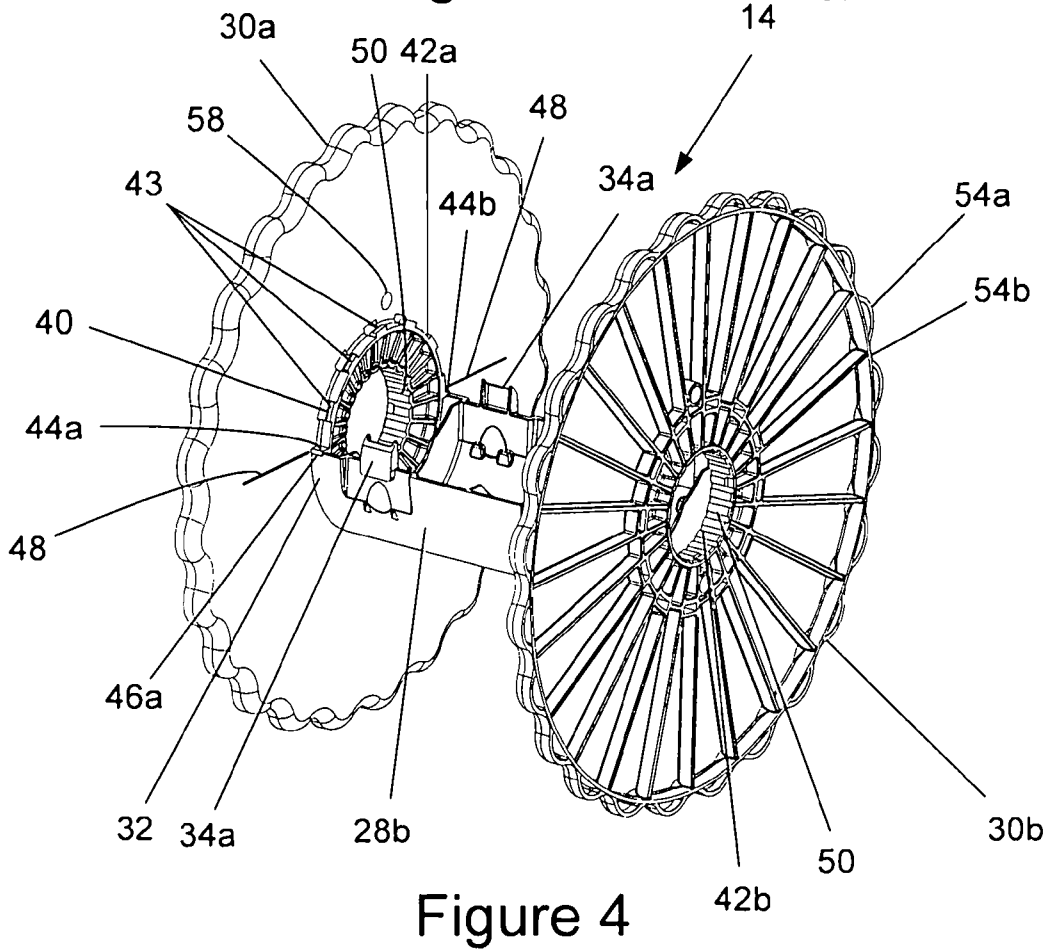
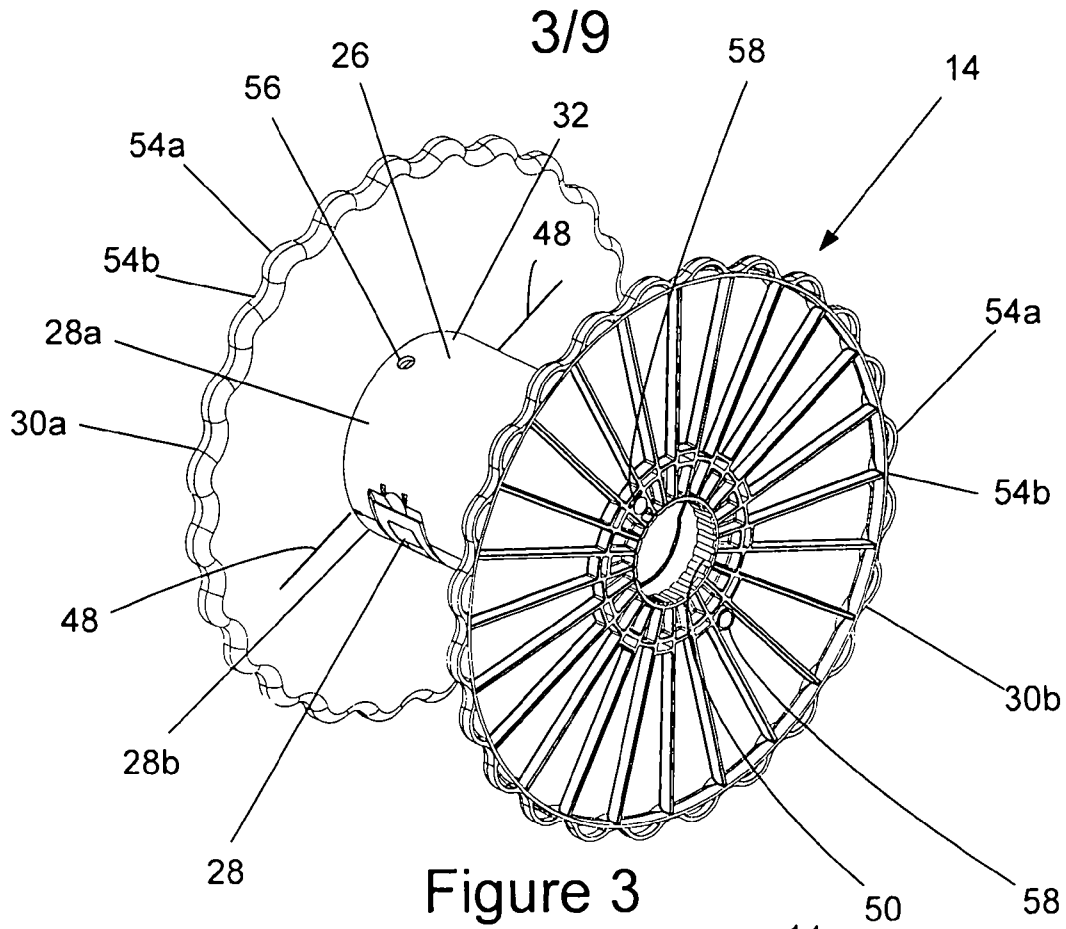


Figure 2



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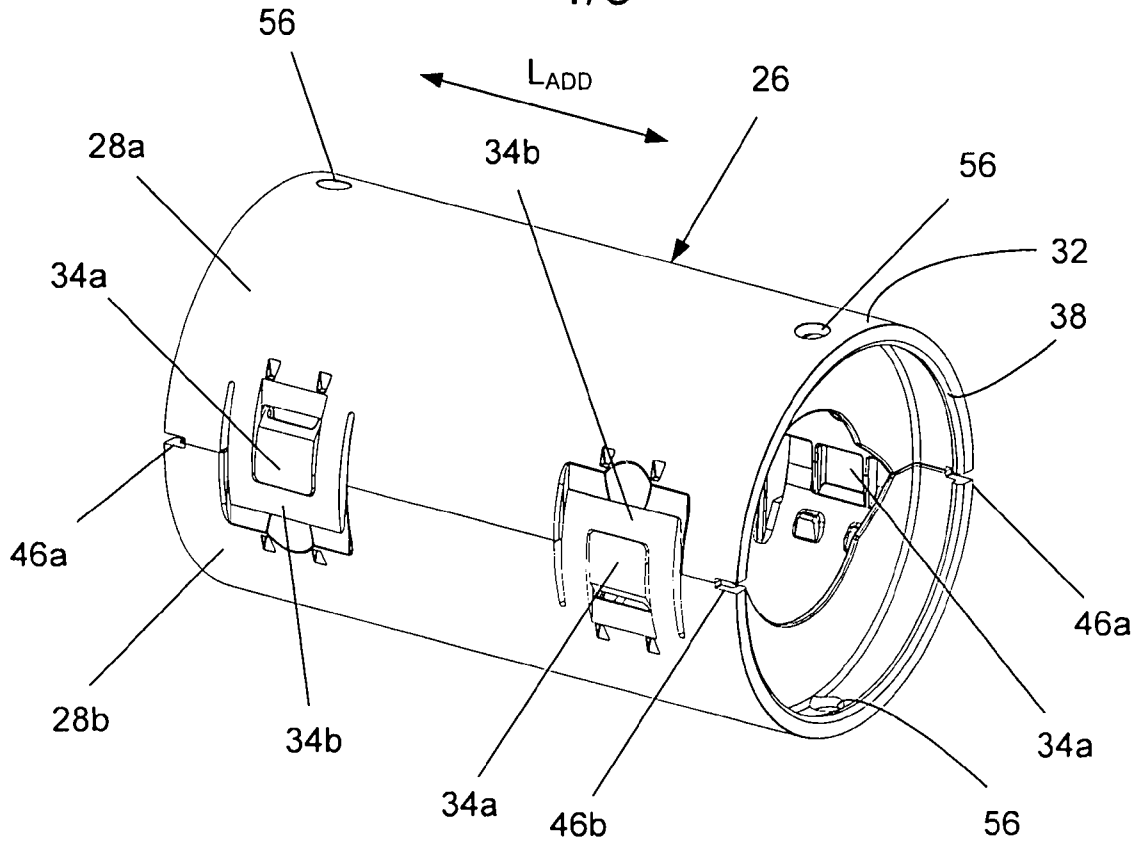


Figure 5

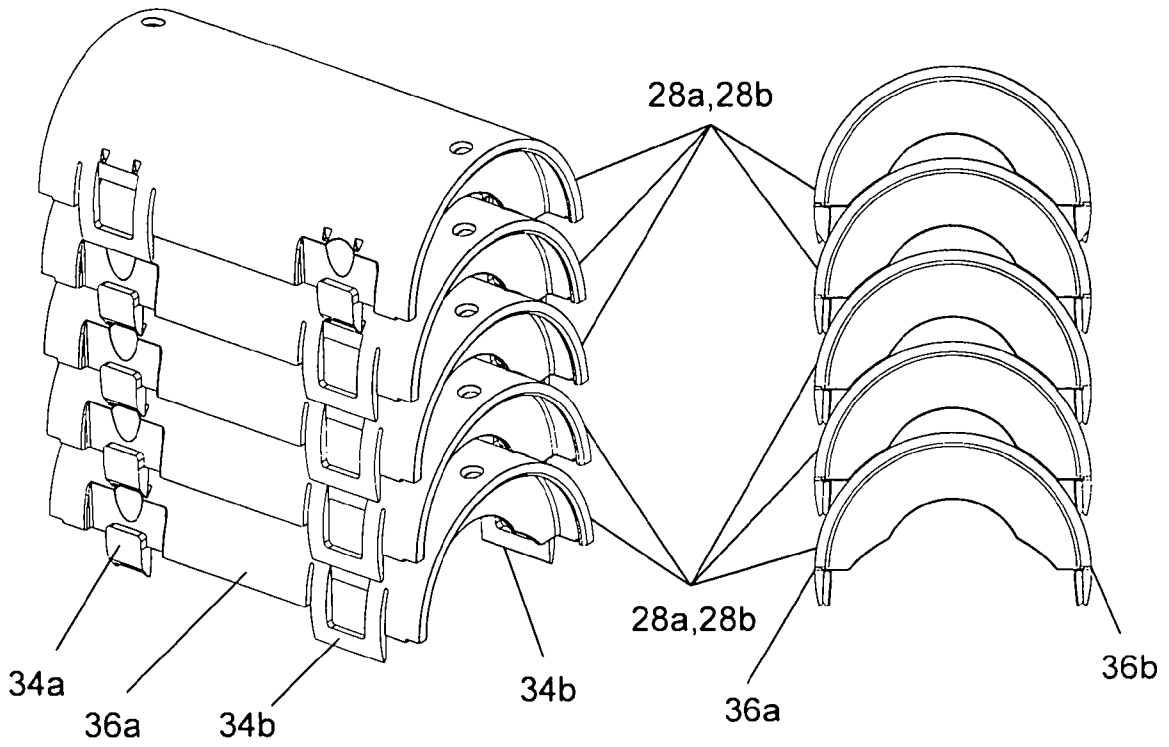
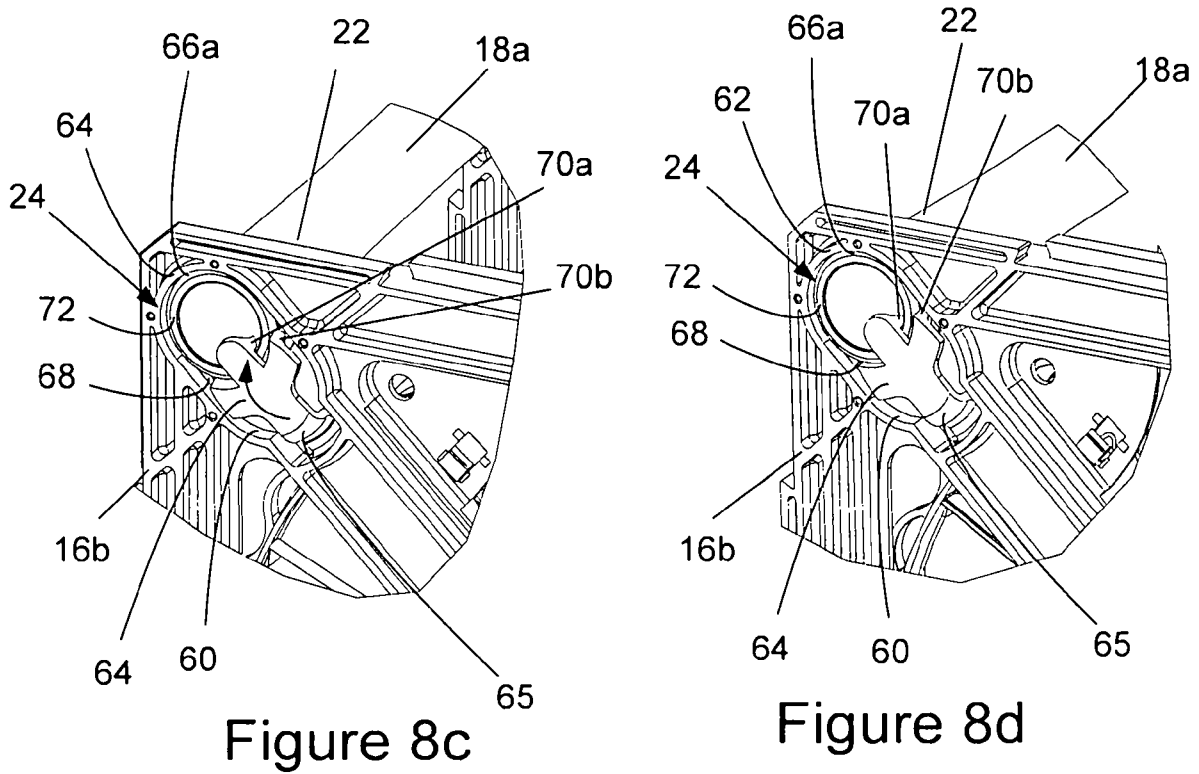
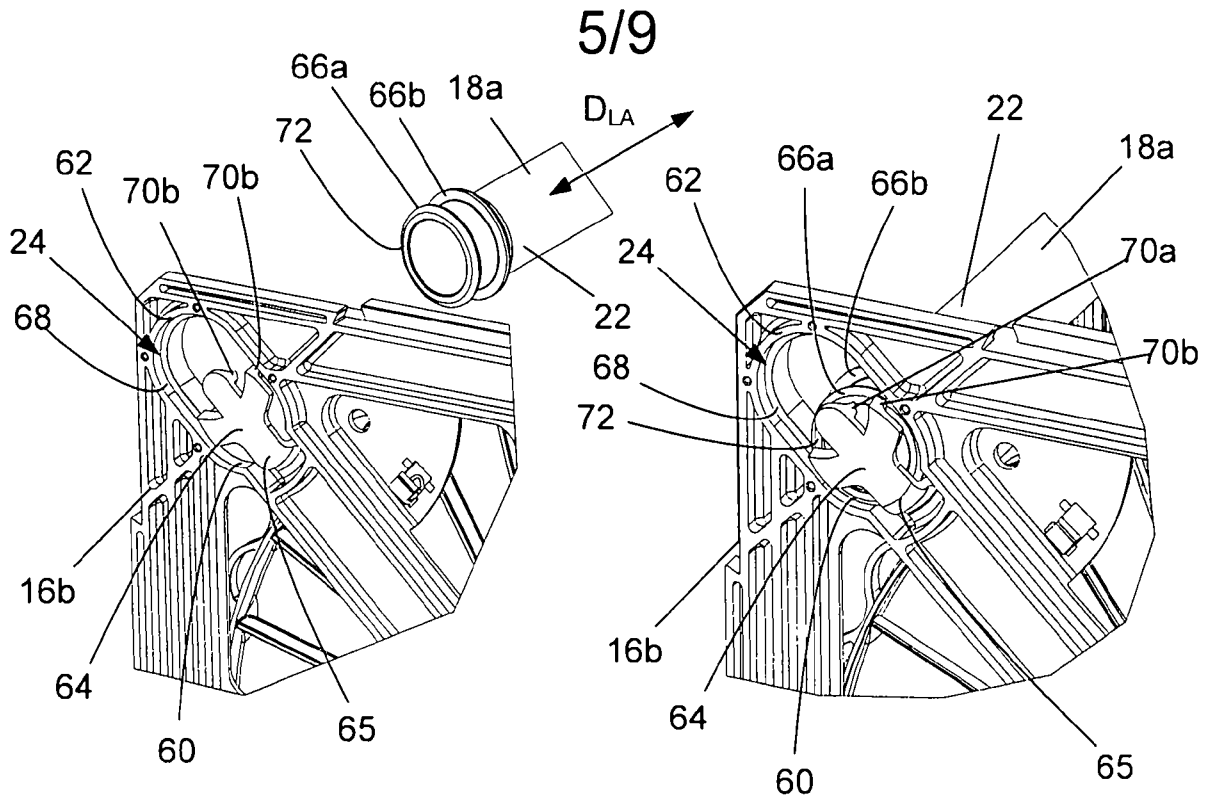


Figure 6

Figure 7



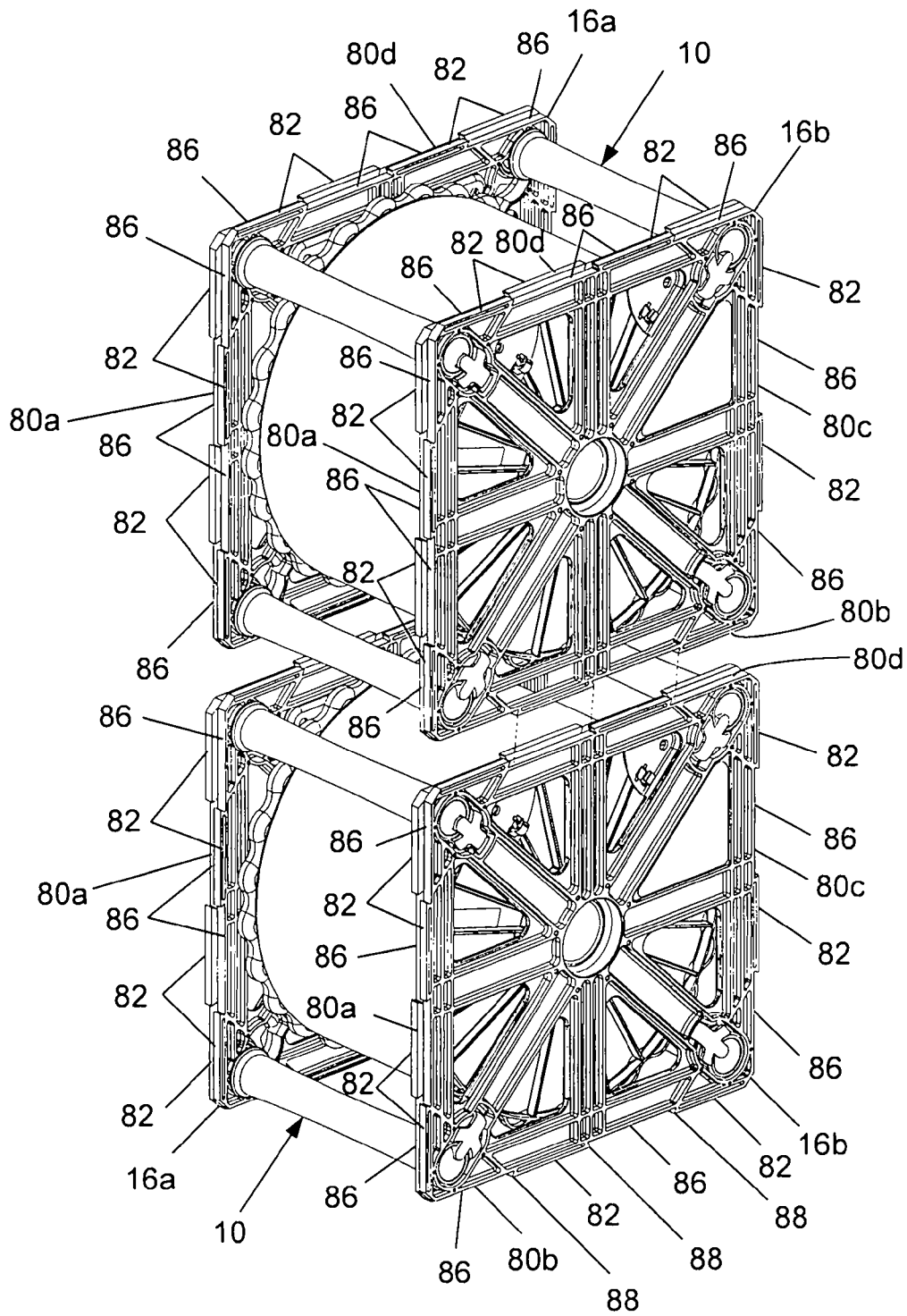


Figure 11

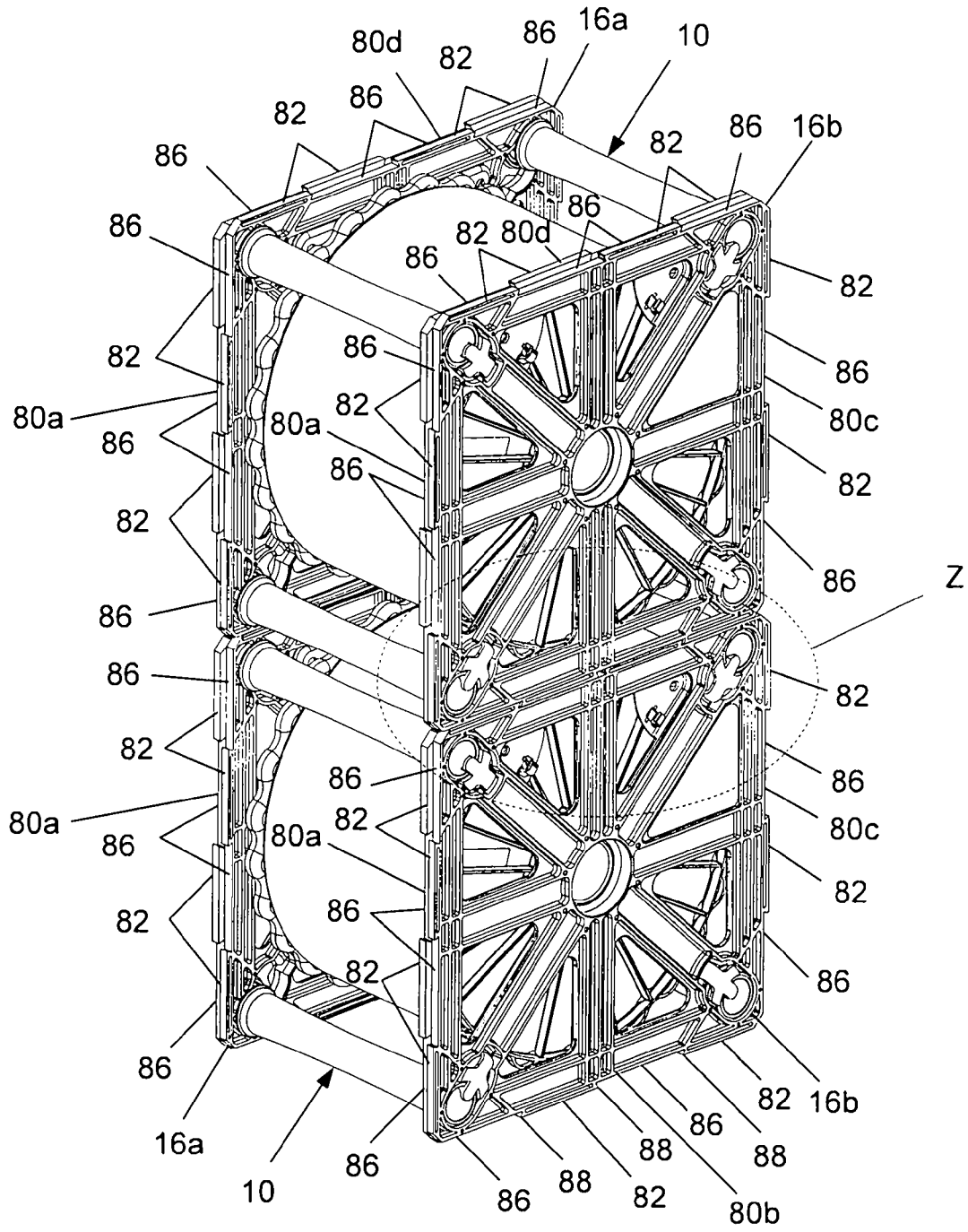


Figure 12

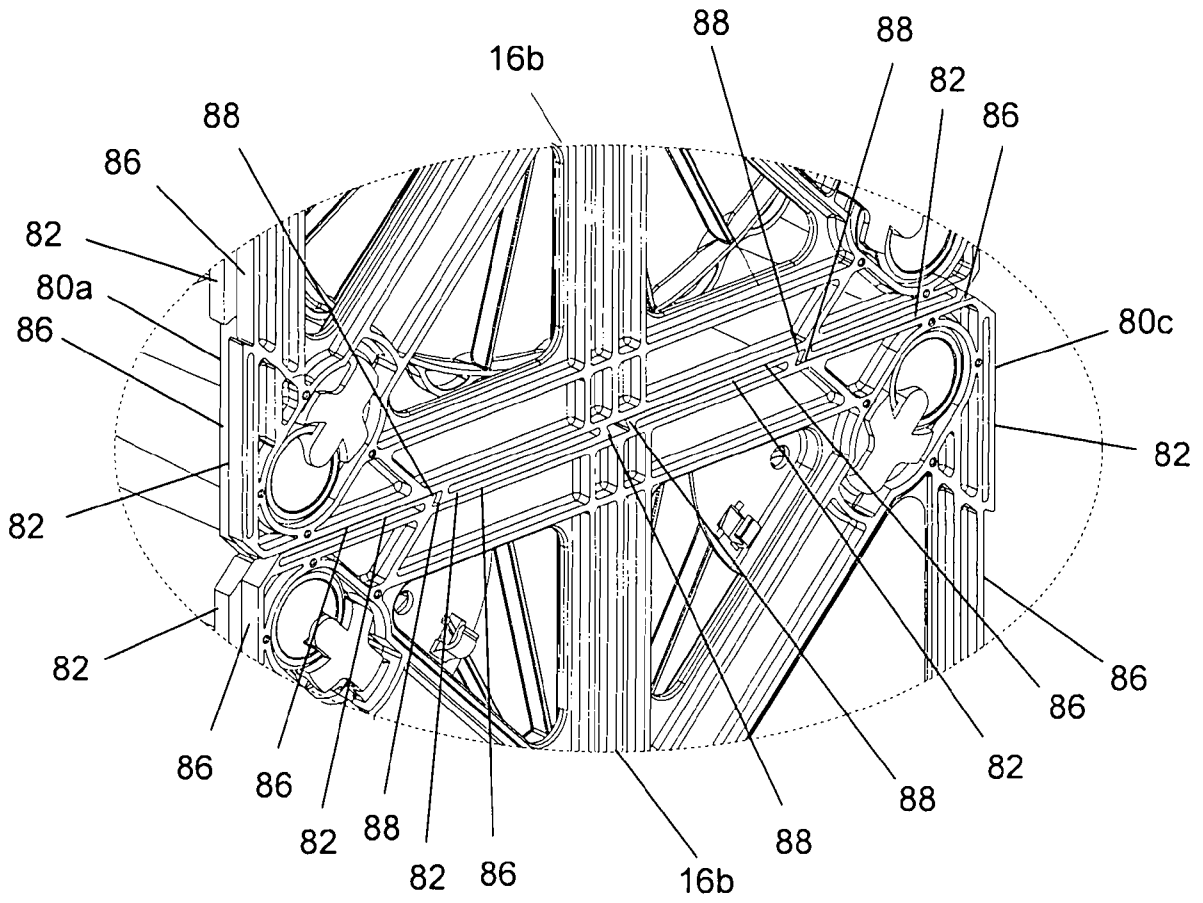


Figure 13