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(54) **Cigarette-making machine and method**

(57) A cigarette-making machine (10) comprises a casing (14), a tobacco slot (18) in the casing (14), and a nipple (16) for retaining a cigarette tube outside the casing (14). A handle (20) / handle drive (22) is accessible from an exterior of the casing (14) to be manually handled. An internal mechanism has a compactor (32) to compact tobacco inserted into the machine through the tobacco slot (18), and a spoon (60) to eject the compacted tobacco into the cigarette tube through the nipple (16).

The internal mechanism is operatively connected to the handle (20) / handle drive (22) so as to be actuated by manual handling of the handle (20) / handle drive (22) to compact and eject tobacco into the cigarette tube. A cigarette receiver (17A) supports a filled cigarette released from the nipple (16). A method to operate the machine (10) is also provided.

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to cigarette-making machines and, more particularly, to cigarette-making machines of the type being operated manually to fill empty cigarette tubes.

2. Background Art

[0002] One manual type of cigarette machine used by individuals to prepare cigarettes one by one involves hand-feeding tobacco which is compacted into substantially cylindrical form into a tobacco receptacle associated with a compactor. The cylinder of tobacco is then ejected into an empty cigarette tube. Such machines have internal mechanisms operated by a single manually operated handle or lever which moves in a circular path. Initially, the handle is at the start of the circular path, the tobacco is dropped into the receiving and compacting means, and the handle is turned actuating compacting means until the tobacco has been compacted into a substantially cylindrical form. When the tobacco compacting means has ceased compacting, further motion of the handle along the arc actuates a plunger or piston arrangement which ejects the compacted tobacco into a cigarette tube

[0003] Often means to hold the cigarette tube in position are supplied and actuated at the beginning of the circular path, and the tube holder can be operated by the action of the compactor means, the plunger means, or independently.

[0004] Traditionally the handle rotates about a fixed axis controlling the tobacco compacting means and the plunger means independently. The tube holder is usually controlled by either of the compactor means or the plunger means. It has been desirable to reduce the number of moving parts to simplify manufacture, to reduce manufacturing costs and to reduce wear of components.

[0005] United States Patent No. 5,088,506, issued to Kastner on February 18, 1992, describes a portable manually operable cigarette making machine. The machine has a handle/handle drive manually operated to induce an internal mechanism in filling an empty cigarette tube supported by a nipple. Tobacco is fed through the nipple into the cigarette tube by a spoon, by a forward rotation of the handle/handle drive. A reverse rotation of the handle/handle drive causes the withdrawal of the spoon from the cigarette, and the release of the filled cigarette from the nipple. The cigarette then falls onto the adjacent surface.

[0006] One of the issues associated with the Kastner machine is that a non-negligible amount of force is required to fill the cigarette using the handle drive. Accordingly, the user positions a first hand on top of the machine to apply weight thereon, while a second hand actuates

the handle drive. The design of the machine is such that the user's first hand fingers can get caught between the handle drive and the casing of the Kastner machine. Otherwise, the fingers of the first hand may inadvertently come into contact with the empty cigarette tube supported by the nipple. The empty cigarette tube is fragile, whereby contact often results in the empty cigarette tube being ripped.

[0007] Also, as both hands are used in the actuation of the machine, the filled cigarette falls to the ground upon being released from the machine. The machine must therefore be used on surfaces large enough to support the machine and provide a receiving surface for the filled cigarette being released from the machine, otherwise the cigarette might fall to the floor. This must be avoided for hygienic reasons and in consideration of the fragility of cigarettes. Additionally, tobacco strands have a tendency of falling out of the cigarette or of the nipple, which tobacco is wasted.

SUMMARY OF INVENTION

[0008] It is therefore an aim of the present invention to provide a cigarette-making machine and method that addresses issues associated with the prior art.

[0009] Therefore, in accordance with the present invention, there is provided a cigarette-making machine comprising: a casing; a tobacco slot in the casing; a nipple for retaining a cigarette tube outside the casing; a handle/handle drive accessible from an exterior of the casing to be manually handled; an internal mechanism having a compactor to compact tobacco inserted into the machine through the tobacco slot, and a spoon to eject the compacted tobacco into the cigarette tube through the nipple, the internal mechanism being operatively connected to the handle/handle drive so as to be actuated by manual handling of the handle/handle drive to compact and eject tobacco into the cigarette tube; and a cigarette receiver to support a filled cigarette released from the nipple.

[0010] Further in accordance with the present invention, there is provided a method for filling an empty cigarette tube with tobacco with a manually operable machine, comprising the steps of: positioning the empty cigarette tube on a tobacco outlet of the machine; filling a tobacco slot of the machine with a tobacco portion; grasping the machine by inserting fingers of a first hand in a grasping volume of the machine and resting a palm of the first hand on a support surface above the grasping volume; rotating a drive of the machine in a forward direction with a second hand such that the machine outlets said tobacco portion into the cigarette tube; and rotating the drive in the reverse direction to release the filled cigarette from the tobacco outlet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Having thus generally described the nature of the invention, reference will now be made to the accom-

panying drawings, showing by way of illustration a preferred embodiment thereof and in which:

[0012] Fig. 1 is a perspective view of a cigarette-making machine in accordance with a first embodiment of the present invention;

[0013] Fig. 2 is a bottom plan view of the cigarette-making machine, with a base plate removed and an internal mechanism in a starting position;

[0014] Fig. 3 is a bottom plan view of the cigarette-making machine of Fig. 1, with the base plate removed and the internal mechanism in a compacting position;

[0015] Fig. 4 is a bottom plan view of the cigarette-making machine of Fig. 1, with the base plate removed and the internal mechanism in an ejection position;

[0016] Fig. 5 is an exploded view of the cigarette-making machine of Fig. 1;

[0017] Fig. 6 is a sectional view taken along section lines 6-6 of Fig. 2 of the cigarette-making machine;

[0018] Fig. 7 is a top plan view of a wheel of the internal mechanism of the cigarette-making machine of Fig. 1;

[0019] Fig. 8 is a perspective view of a compactor of the internal mechanism of the cigarette-making machine of Fig. 1;

[0020] Fig. 9 is a perspective view of a cigarette tube retainer of the internal mechanism of the cigarette-making machine of Fig. 1; and

[0021] Fig. 10 is a perspective view of a block of the internal mechanism of the cigarette-making machine of Fig. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Referring now to the drawings, a cigarette-making machine is generally indicated by the numeral 10 in Fig. 1. From an exterior viewpoint, the cigarette-making machine 10 has a base plate 12, a casing 14, a cigarette tube nipple 16, a cigarette/tobacco receptacle 17, a tobacco trough/slot 18, a handle 20, a handle drive 22, and a grasping surface 23.

[0023] The base plate 12 is the interface between a support surface and the cigarette-making machine 10. The base plate 12 supports a remainder of the cigarette-making machine 10. The base plate 12 typically has cushions (not shown) on a bottom surface, which cushions are of a resilient anti-slip material. This ensures that the machine 10 stays in place on a support surface, and that the base plate 12 of the machine 10 does not damage the support surface.

[0024] The casing 14 forms the outer shell of the cigarette-making machine 10, and accommodates an internal mechanism of the machine 10.

[0025] The cigarette tube nipple 16, as best shown in Figs. 2 and 5, supports a free end of a cigarette tube being filled with tobacco by the cigarette-making machine 10.

[0026] The cigarette/tobacco receptacle 17 has a cigarette slot 17A to support a filled cigarette at the discharge from the cigarette tube nipple 16. Moreover, the

receptacle 17 facilitates the alignment and engagement of an empty cigarette tube with the cigarette tube nipple 16. The cigarette/tobacco receptacle 17 has tobacco-collecting surfaces 17B extending on both sides of the cigarette slot 17A, so as to collect any tobacco falling from a cigarette or from the cigarette tube nipple 16.

[0027] The tobacco slot 18 is the inlet for tobacco for the cigarette-making machine 10. Accordingly, the mechanism of the cigarette-making machine 10 is fed tobacco through the tobacco slot 18, so as to be subsequently filled in an empty cigarette tube via the cigarette tube nipple 16. The surrounding of the slot 18 is funnel-shaped, as shown in Fig. 1, to cause the tobacco to move toward the slot 18 by the effect of gravity.

[0028] The handle 20 and the handle drive 22 cooperate to actuate the mechanism within the cigarette-making machine 10. The handle 20 is configured so as to be handled manually.

[0029] Grasping volume 23 is provided to facilitate the grasping of the machine 10 by a user person when the handle 20 and the handle drive 22 are being driven to make a cigarette.

[0030] A bottom view of the machine is shown in Fig. 2, with handle drive 22 in the starting position. The drive handle 22 is operatively secured to a wheel 24. The wheel 24 is mounted on shaft 26 (Fig. 6), which is rotatable with respect to base plate 12. The wheel 24 has a cam 28 (Fig. 5), operatively accommodated in cavity 30 (Fig. 5) of the compactor 32.

[0031] The compactor 32 slides back and forth along direction A between guides 36 and 38 of a block 39, as a result of the camming action between the cam 24 and the periphery of the cavity 30. The compactor 32 is also shown in Fig. 8.

[0032] When the compactor 32 is in the starting position of the internal mechanism (Fig. 2), the compactor 32 is away from the tobacco slot 18 such that tobacco may enter into the tobacco slot 18 and fill the space between the compactor 32 and a spoon 60, as seen in Fig. 6.

[0033] Rotating handle drive 22 in an anticlockwise direction, as viewed from below from the starting position of Fig. 2 to the compacting position of Fig. 3, urges the compactor 32 forward to its furthest forward compacting the tobacco, as the cam 28 contacts the periphery of the cavity 30. At the same time, the forward motion of compactor 32 allows cigarette tube retainer 40 to be urged forward to contact cigarette tube nipple 16 by the biasing action of spring 42 acting against fixed stop 44. When the compactor 32 is in the starting position (Fig. 2), the cigarette tube retainer 40 is held back by projection 46 engaging recess 48 of the compactor 32. The cigarette tube retainer 40 is also illustrated in Fig. 9. The spring 42 biasing the retainer 40 is selected so as to produce a biasing force that will not damage the cigarette tube, while securely holding the tube during the filling procedure.

[0034] As the handle drive 22 reaches the compacting position shown in Fig. 3, the compactor 32 has reached its forward point, where it effectively remains for the rest

of the motion of the handle drive 22. Continuation of the movement of the handle drive 22 allows stud 50 of the wheel 24 to engage lever 52, urging it anticlockwise against the pressure of retaining spring 54 attached to the casing 14. The lever 52, pivoted about the shaft 26, brings connecting link 58 with it pivoting between pivots 57 and 59, moving tobacco plunger and spoon 60 (Fig. 5) towards and through the cigarette tube nipple 16. Accordingly, tobacco (not shown) is ejected into the cigarette tube (not shown), and the ejection position is shown in Fig. 4.

[0035] On releasing the handle drive 22 from the ejection position, the spring 54 contracts rotating the wheel 24 in a clockwise direction, returning the machine to the position shown in Fig. 3. Thereafter, the handle drive 22 is returned to the position of Fig. 2, such that the cigarette tube retainer 40 releases the filled cigarette (not shown) from the nipple 16. The stud 51 engages the lever 52 at the end of the return travel, preventing further motion. It is pointed out that the choice of spring to be used as spring 54 involves the consideration of the effort required to make a cigarette. It is considered to use springs opposing less tension against the movement of the handle drive 22 when a cigarette is being made.

[0036] As the cigarette tube retainer 40 releases it, the filled cigarette (not shown) is received in the cigarette/tobacco receptacle 17. More specifically, the cigarette slot 17A is aligned with the nipple 16 such that the filled cigarette is accommodated within the slot 17A. In the illustrated embodiment, the slot 17A is generally at the same height as the nipple 16, such that the cigarette tube (not shown) is supported against gravity through the steps of being filled. Moreover, this vertical alignment of the nipple 16 with the cigarette slot 17A facilitates the positioning of an empty cigarette tube on the nipple 16. More specifically, an empty tube is simply positioned in the slot 17A, and is slid toward engagement with the nipple 16, the tube being guided into engagement by the slot 17A. Therefore, the risks of a cigarette tube being ripped are reduced, whether when engaging a tube on the nipple 16, during filling of the tube, or once the filled cigarette is discharged.

[0037] The receptacle 17 is in a concavity of the casing 14, and is therefore distanced away from the upper surface of the casing 14. Therefore, the potential for inadvertent contact between the hands of the user actuating the machine 10 and the cigarette are reduced by this configuration.

[0038] Moreover, the cigarette slot 17A and tobacco-collecting surfaces 17B collect any residual tobacco falling out of the cigarette as the cigarette falls from the nipple 16 or as the cigarette is picked up. Tobacco falling out of the nipple 16 also gathers in the slot 17A or on the surfaces 17B, whereby the machine 10 can be tilted and the tobacco can be manually collected to be used for another cigarette.

[0039] During use of the machine 10 to fill an empty cigarette tube with tobacco, it is preferred that the fingers

of the left hand of the user be accommodated in the grasping volume 23, while the palm of the left hand ergonomically rests on the upper surface of the casing 14 above the grasping volume 23. The right hand of the user actuates the handle 20/handle drive 22. It is pointed out that in this ergonomic position, the left hand is away from the path of movement of the handle drive 22, thereby avoiding incidents between the fingers of the left hand the handle drive 22.

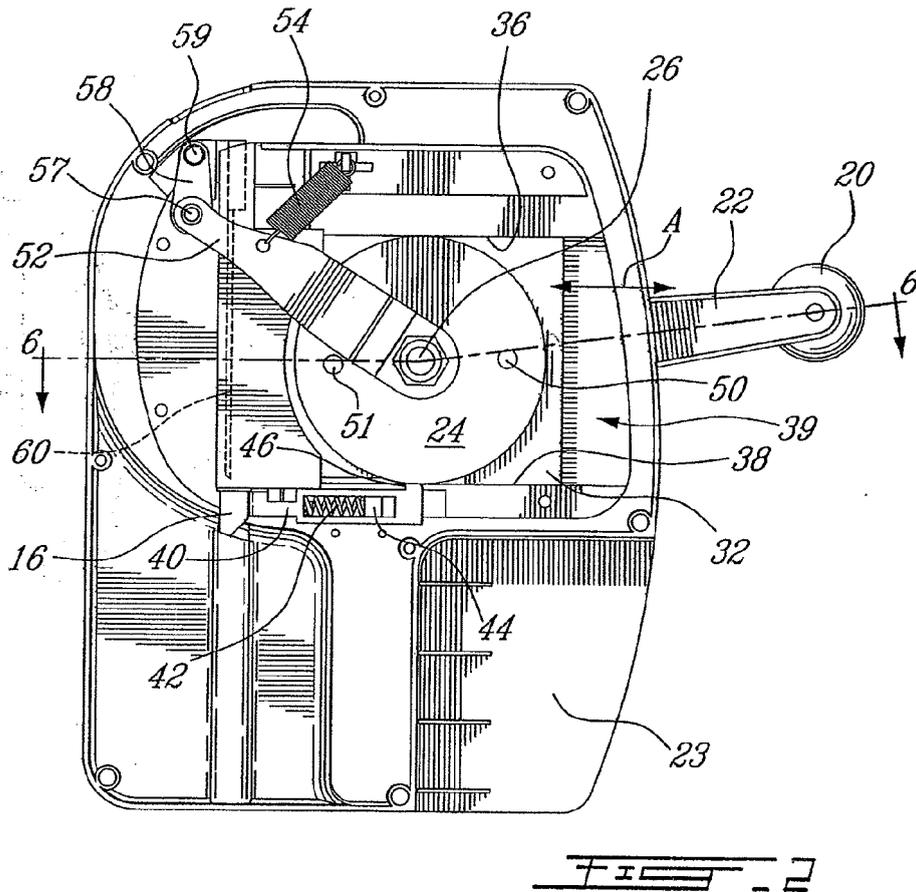
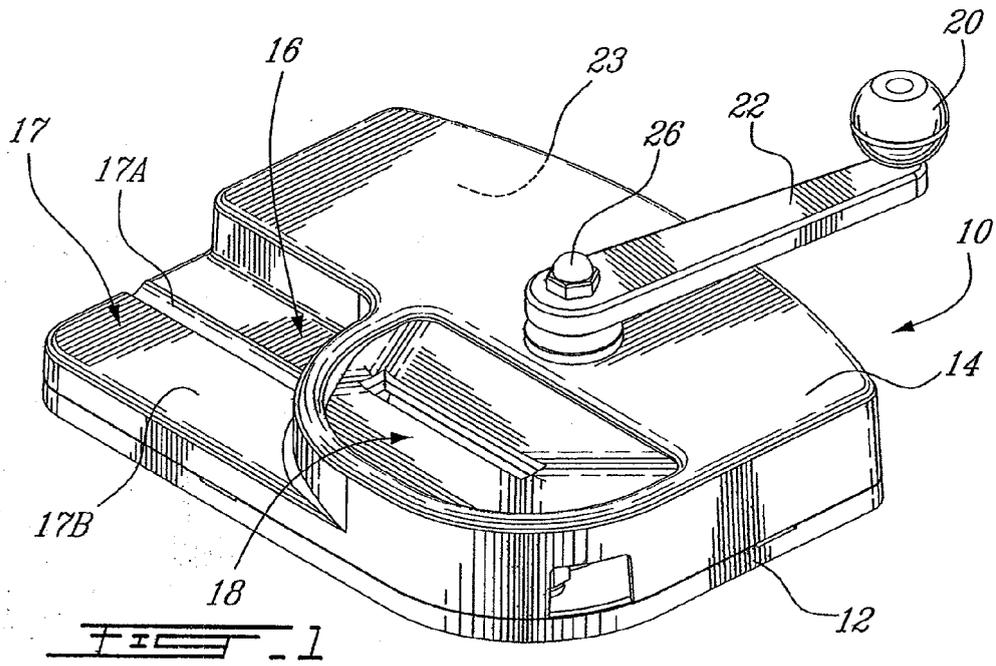
[0040] The machine 10 is simplified over the machines of the prior art in the number of pieces it has. Referring to Fig. 10, the block 39 of the internal mechanism is preferably a single piece that will guide the translational motion of the compactor 32 along direction A (Fig. 2), through guides 36 and 38. The block 39 also incorporates a slot 62 in which the spoon 60 (Fig. 5) will be accommodated and will form a compacting chamber with the compactor 32 (Fig. 3). The fixed stop 44 is also part of the block 39. The block 39 is typically cast in a rigid metallic material.

Claims

1. A cigarette-making machine comprising:
 - a casing;
 - a tobacco slot in the casing;
 - a nipple for retaining a cigarette tube outside the casing;
 - a handle/handle drive accessible from an exterior of the casing to be manually handled;
 - an internal mechanism having a compactor to compact tobacco inserted into the machine through the tobacco slot, and a spoon to eject the compacted tobacco into the cigarette tube through the nipple, the internal mechanism being operatively connected to the handle/handle drive so as to be actuated by manual handling of the handle/handle drive to compact and eject tobacco into the cigarette tube; and
 - a cigarette receptacle to support a filled cigarette released from the nipple.
2. The cigarette-making machine of claim 1, wherein the cigarette receptacle is a slot aligned with the nipple.
3. The cigarette-making machine of claim 2, wherein the slot is generally at the same height as the nipple, such that the cigarette tube is guided by the slot when engaged with the nipple, and is supported by the slot when the cigarette is being filled.
4. The cigarette-making machine of claim 2, wherein the cigarette receptacle has a pair of collecting surfaces on opposed sides of the slot to collect residual tobacco.

5. The cigarette-making machine of claim 1, wherein the cigarette receptacle is in a concavity of the casing.
6. The cigarette-making machine of claim 1, wherein a surrounding of the tobacco slot in the casing is funnel-shaped. 5
7. The cigarette-making machine of claim 1, wherein the casing defines a grasping volume grasped by a first hand of the user while a second hand of the user actuates the handle drive, the grasping volume being away from a path of motion of the handle drive. 10
8. The cigarette-making machine of claim 1, wherein the internal mechanism has a tube retainer retaining the cigarette tube when being filled, and releasing the cigarette tube once filled. 15
9. The cigarette-making machine according to claim 1, wherein the internal mechanism has an integrally-formed block supporting and guiding a motion of the compactor and the spoon. 20
10. A method for filling an empty cigarette tube with tobacco with a manually operable machine, comprising the steps of: 25
- positioning the empty cigarette tube on a tobacco outlet of the machine; 30
- filling a tobacco slot of the machine with a tobacco portion;
- grasping the machine by inserting fingers of a first hand in a grasping volume of the machine and resting a palm of the first hand on a support surface above the grasping volume; 35
- rotating a drive of the machine in a forward direction with a second hand such that the machine outlets said tobacco portion into the cigarette tube; and 40
- rotating the drive in the reverse direction to release the filled cigarette from the tobacco outlet.
11. The method of claim 10, further comprising a step of collecting the filled cigarette from a cigarette receptacle of the machine. 45
12. The method according to claim 11, further comprising a step of tilting the machine to manually collect residual tobacco accumulated in the cigarette receptacle of the machine for subsequent use, after having collected the filled cigarette from the cigarette receptacle. 50
13. The method according to claim 10, wherein the step of positioning the empty cigarette tube in a tobacco outlet of the machine is performed by placing the empty cigarette tube in a cigarette receptacle of the 55

machine, and by sliding the empty cigarette tube guidingly along the cigarette receptacle and into engagement with the tobacco outlet.



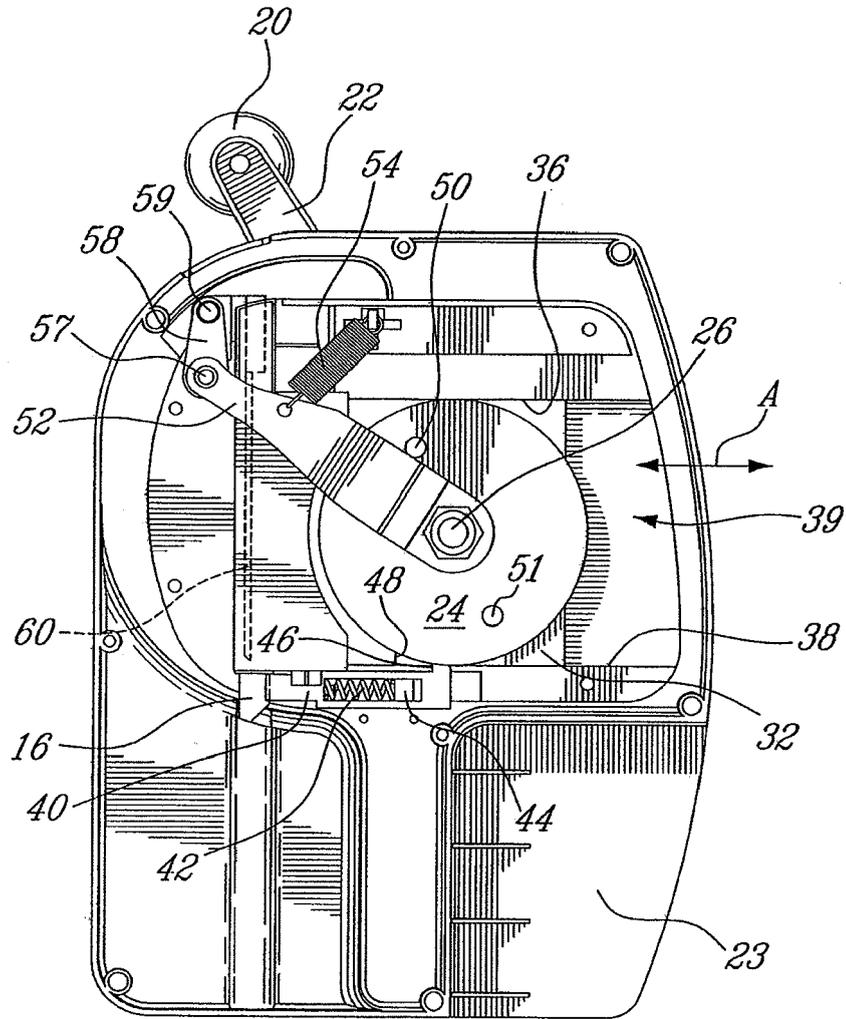


FIG. 3

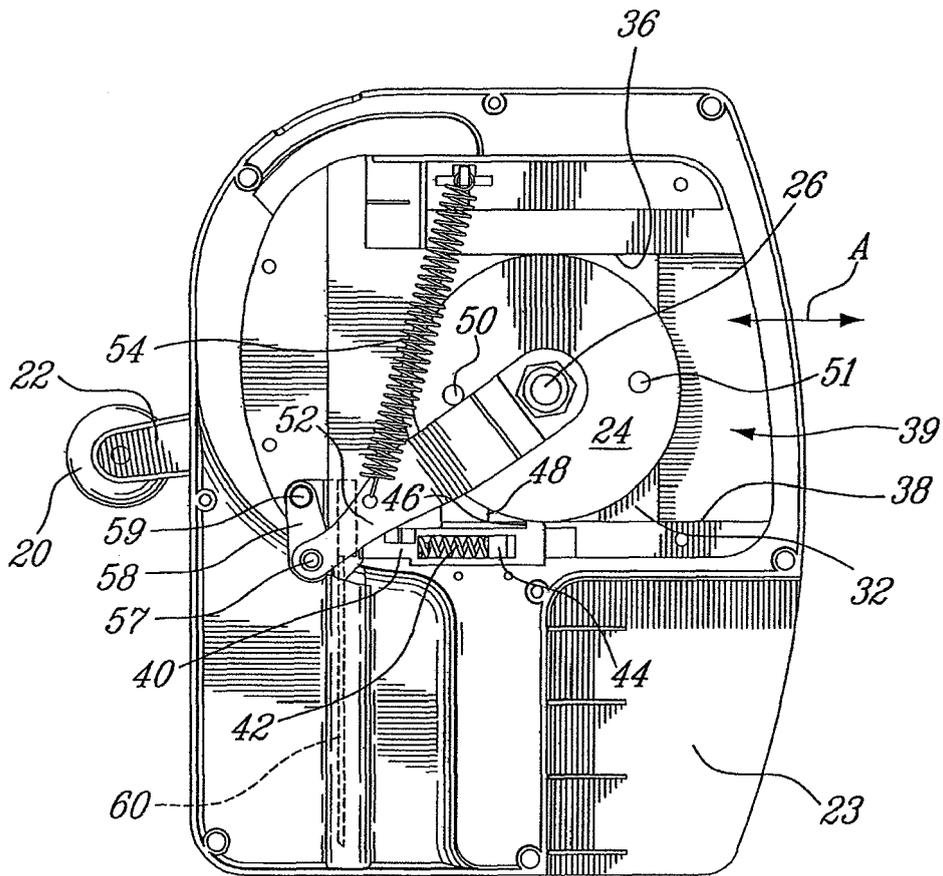
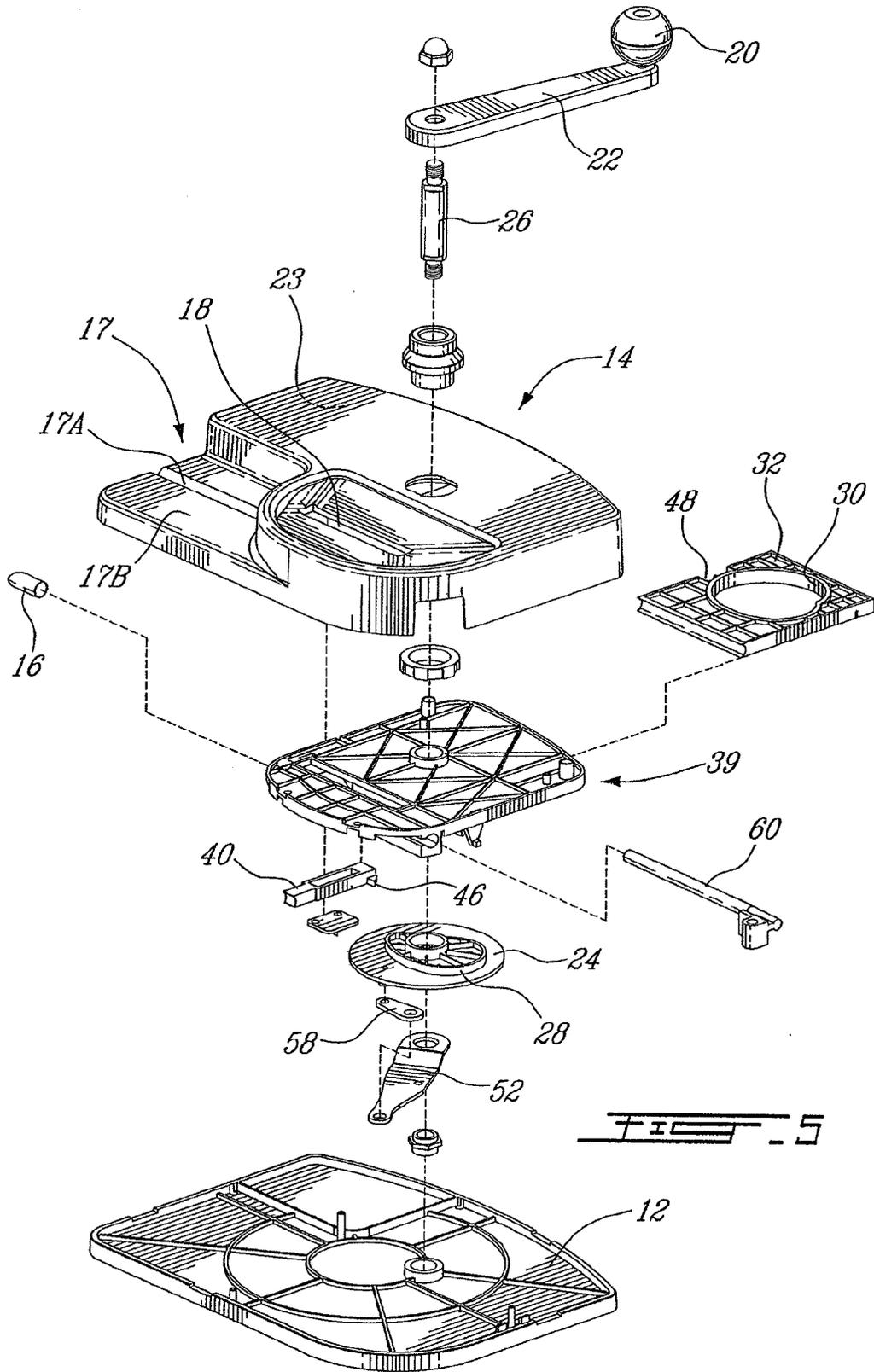
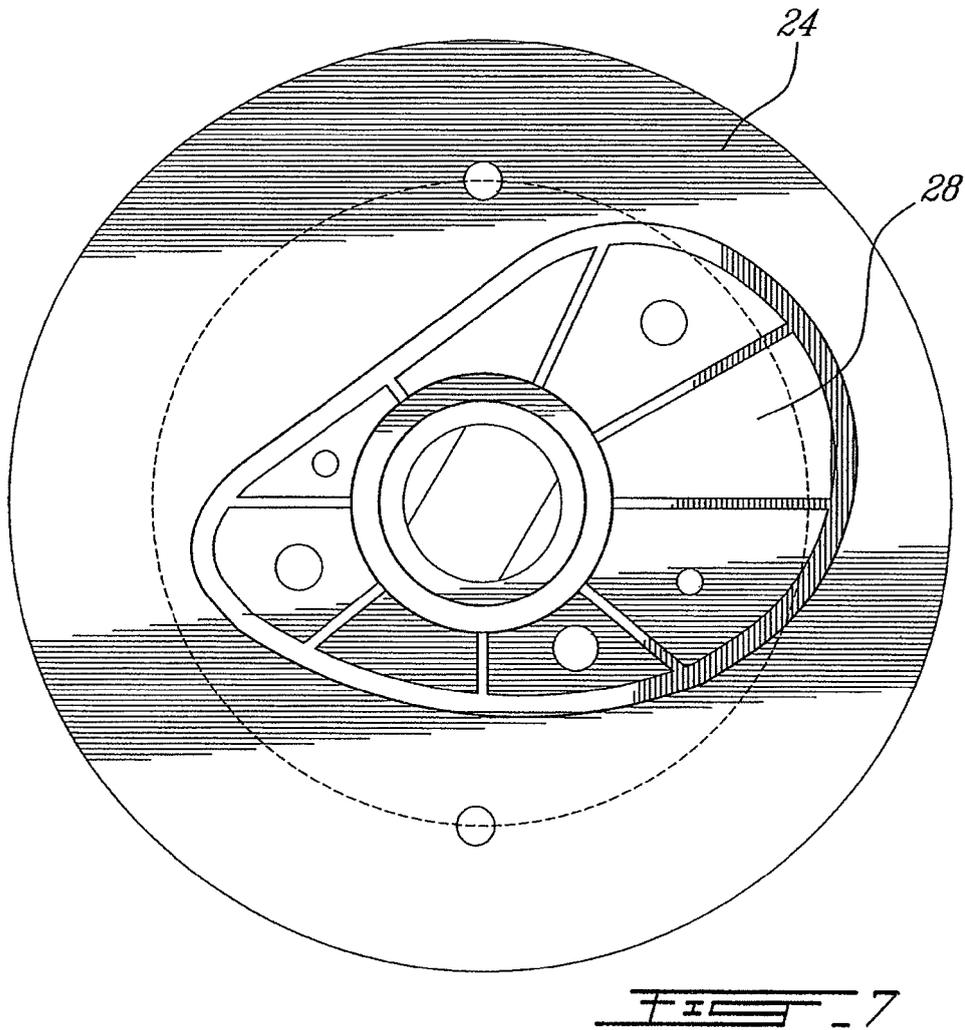
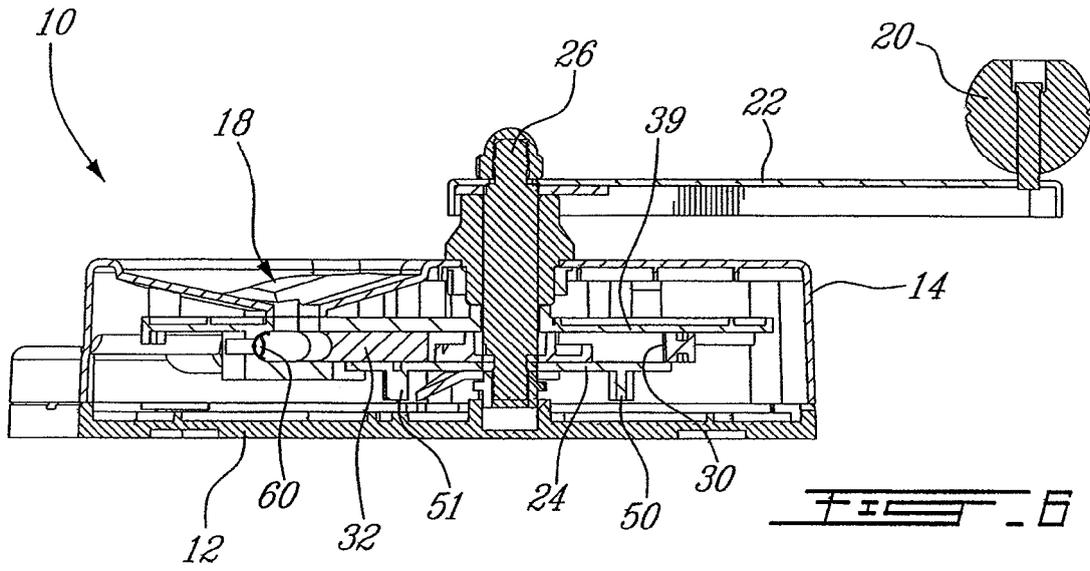


FIG. 4





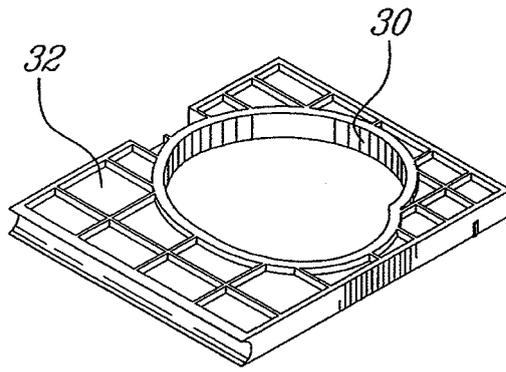


FIG. 8

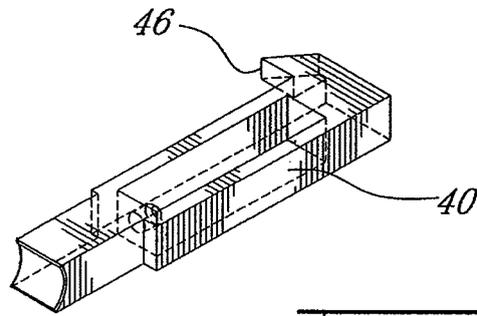


FIG. 9

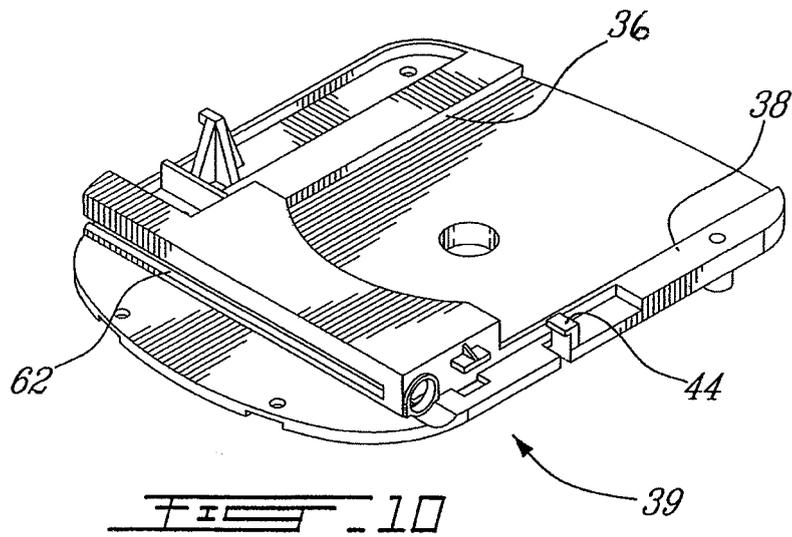


FIG. 10



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
Munich		26 September 2007	MARZANO MONTEROSSO
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503.03.82 (P04G01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 07 11 1213

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