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(11) **EP 1 387 328 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
30.03.2005 Bulletin 2005/13

(51) Int Cl.7: **G07D 9/00**

(21) Application number: **03380179.6**

(22) Date of filing: **21.07.2003**

(54) **Hopper**

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(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 PT RO SE SI SK TR**

(30) Priority: **29.07.2002 ES 200201783**

(43) Date of publication of application:
04.02.2004 Bulletin 2004/06

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Description

Object of the invention

[0001] The present invention relates to as a hopper, designed for application in amusement machines and in all types of coin-operated machines in general. The hopper is the "wheel" type modulated by three basic parts working together forming a revolving unit, wherein one of these parts is modulated by a coin conveyor disc, while one of the other parts, attached to the previous one, is formed by a plurality of radial and elastic arms protruding from a central core connected to the conveyor disc and whose elastic arms form scrapers that, by means of the third part, is also formed by radial arms supported on the aforementioned elastic arms protruding slightly through the respective slots established for said purpose in the coin conveyor arm; all of this forming an unit that when rotating pulls, between each pair of slots and hence between each pair of scrapers protruding therefrom, a coin, which upon reaching a trigger in the chassis in which the unit is mounted, will pass to the corresponding coin guide slot and at the same time cause the withdrawal of the respective scraper.

[0002] The object of the invention is to provide a hopper with the fewest number of parts possible that offers greater speed and reliability in the exit of coins with regard to the devices designed for such purposes.

Background of the invention

[0003] The "wheel" type of coin-operated mechanisms commonly known as HOPPERS, used generally in amusement and coin-and-token-operated machines, present a series of problems, of which the following can be highlighted:

- The need to use the same type of hopper for similar size coins.
- Configuration of coin container and
- Configuration of coin container and corresponding conveyor disc unit as two sub units connected by coil springs in order to prevent coin jamming, which is a frequent problem and usually causes the break down of the motor and other problems.
- High costs involved in obtaining hoppers with an acceptable level of quality and functions.

[0004] However, in the Spanish patent of invention with publication number ES 2119709, a hopper for payment mechanisms based on a revolving disc with a series of radial slots is disclosed. This disc is situated inside the compartment that receives the coins and constitutes one of the walls thereof. In each slot there is retractable scraper protruding towards one side of the disc, so that when the disc turns only the coins are pulled, i.e. each coin is positioned between two scrapers protruding through two consecutive slots reaching a

point where a trigger diverts the coins towards the coin guide slot.

[0005] Although this hopper resolves a series of problems found in conventional hoppers, it is on the other hand structurally complex, since it requires as many scrapers as there are slots in the disc. This hopper also requires other elements that push the scrapers towards the emergency position so that after the withdrawal of each scraper when passing the area where the coins are diverted, the scraper occupies its emergency position in order to pull once again new coins that it collects from the coin compartment.

[0006] Therefore, in that patent of invention with publication number ES 2119709 there are a series of radial and retractable scrapers which in emergency position pull the coins and in the withdrawn position allow the coins to be diverted towards the coin guide slot.

Description of the invention

[0007] The "wheel" type hopper, object of the invention, is designed as an anti-jamming system able to operate with different size coins and achieve better speed and reliability in the exit of the coins in comparison to those hoppers known to date and all of this is based on an unit modulated by three basic parts, all of simple structure, easy to assemble and highly functional.

[0008] More specifically, the hopper includes a coin conveyor disc as is conventional, a radial and elastic arm disc protruding from a core, hereinafter referred to as a "multi-scraper marguerite with elastic arms," and another plurality of arms, also radial, protruding from another central core, hereinafter referred to as an "auxiliary support marguerite", so that when assembled these three parts are attached to one another so that the disc constitutes a lateral wall of the coin container with this disc being powered by a motor such as those typically used in conventional hoppers. There are also a number of radial slots starting from a half circumference of the disc reaching out to the perimeter thereof, with the minimal distance between the slots being the diameter of the largest coin intended to be transported. Logically, the number of slots is variable according to the coins or tokens to be used and is therefore in proportion to the diameter of the disc required.

[0009] There are other T-shaped scrapers positioned in those slots at the far ends of the respective elastic arms belonging to the aforementioned "multi-scraper marguerite with elastic arms", so that the scrapers are positioned in such a way that they project through the slots over the exterior surface of the disc, constituting a series of radial projections that act as a stop; pulling and moving the coin from the bottom of the container to the upper part of the disc. Having reached a certain point, the trigger forces the scrapers, in their rotation, to withdraw into their slots until they no longer project, passing beneath the aforementioned trigger and returning once more to their initial projection position. By means of this

trigger, the coins continue to be situated in the exit canal so they can be moved finally towards the exterior, previously passing an accounting control, which directs the whole mechanical system of operation.

[0010] The "multi-scraper marguerite with elastic arms" is formed by a series of radial arms that project from a central core uniting them in the central area of the disc, specifically on the rear face of this. The elastic arms are at an equal angular distance to the disc slots so that the scrapers, which form a part of the elastic arms, are positioned in the slots of the revolving disc. All of this is done in such a way so that the overhanging part of the scrapers through the slots presents a sufficient enough projection to support and push the coin that it has to pull when the array rotates.

[0011] Also, each elastic arm has at its end a small flange acting as a trigger facilitating its movement and the withdrawal of the scraper until situating it close to the surface of the disc, when the scraper in its rotation should find itself in position with the trigger established for such purpose in the chassis the disc is mounted in.

[0012] The third part referred to as an "auxiliary support marguerite" is also formed from a core from which radial arms extend acting as a spring supported on the arms of the "multi-scraper marguerite." This constitutes a coil spring by means of which it is possible to maintain the elasticity and stability of the scrapers, which constitute the elastic arms of the aforementioned "multi-scrap-er marguerite."

[0013] The conjunction of the three parts referred to supports the unit of the hopper and is vital to the correct working thereof. Likewise, so are the absences of block-ages or jams that may indirectly lead to the breakage of motors. In the event of any coins becoming jammed in the container hampering the rotation of the rotary disc because of the clogging of coins on the scrapers, then the scrapers as a result of the pushing movement of the coins would withdraw to the interior of the disc. The disc is therefore transformed from a revolving disc with radial shaped projections to a flat revolving disc with no pro-jections. In consequence, the disc would rotate without any obstacle, with the jam being removed and the scrap-ers turning once again in their projected position and the revolving disc configured with projections and disc.

[0014] According to these structural characteristics of the hopper, each time a scraper in its movement meets the trigger, it will withdraw just before hand, passing be-neath this and freeing itself up again after passing the trigger.

[0015] This function is achieved by the withdrawal of the scraper at a predetermined point when a projection or trigger on a slide, designed in the disc's assembly chassis, converges with a flange designed at the end of the scraper or elastic arm. This is so that the disc during its rotation gets each scraper to pass the same set point forcing them to withdraw and freeing itself up after com-pleting a sector of the circumference, which is modulat-ed by the aforementioned trigger slide.

[0016] Logically, the "multi-scraper marguerite with elastic arms" can take shape in different ways, so long as it maintains the aforementioned characteristics.

5 Description of the drawings

[0017] To complement the description being made and in order to provide a better understanding of the characteristics of the invention, according to a special example of its practical embodiment, a set of drawings with illustrative rather than limiting characteristics is en-closed as an integral part of these specifications:

Figure 1 shows a side, top schematic view of the hopper made in accordance with the object of the invention, forming one of the walls of the container.

Figure 2 shows a frontal view of the hopper assembly made in accordance with the object of the invention.

Figure 3 shows a frontal detail of the slide raised and extended in the general chassis of the re-volving disc unit where withdrawal of the scraper occurs.

Figure 4 shows a perspective view of the revolving disc and disc that form a part of the unit of the hopper of invention in which one can see the arrangement and shape of the radial slots.

Figure 5 shows a perspective view of the "multi-scrap-er marguerite with elastic arms." This view is the front face of the marguerite.

Figure 6 shows another perspective view, in this case the rear face of the "multi-scrap-er mar-guerite with elastic arms" illustrated in the previous figure.

Figure 7 shows a view of auxiliary marguerite as third part of the unit of the hopper of the inven-tion.

40 Preferred embodiment of the invention

[0018] In view of the ictures described, one can see how the hopper of the invention, usable in amusement machines and coin-operated machines, includes three fundamental parts (1), (2) and (3), wherein part (1) is a disc with a central hole (4) to be mounted on an axis supported thereby and which will be used for rotation by means of an appropriate motor. The disc and revolving disc (1) are modulated by the plurality of radial slots (5), 15 in total, without ruling out any other number, so that this disc (1) will constitute one of the walls of the con-tainer (6) of the coins (7), as shown in figure 1 and whose container (6), disc (1) and naturally parts (2) and (3) at-tached to it, will be situated in a semi vertical position, slightly sloping towards the exterior.

[0019] The part (2) known as "multi-scrap-er margue-rite" is built from a core with a central passage (2') by

means of which the assembly is attached to the revolving disc (1), so that from this core (2) a series of elastic and radial arms (8) protrude ending in scrapers (9) with the number of arms (8) equal to the number of slots (5) on the revolving disc (1). The scrapers (9) are positioned in the slots and protrude slightly with regard to the internal plane of the revolving disc (1). They form projections in between which areas (10) of position are determined for the coins (7), which will be pulled between the projections guiding the scrapers (9) that protrude through the slots (5).

[0020] The scrapers (9) also include a flange or small projection (11) serving as a trigger to enable its movement and withdraw the scraper (9), or do the same in the plastic arm unit (8) until situating it close to the surface of the disc (1), whereby the scraper (9) in its rotational movement should end up in position with the trigger slide (12). This operation is realised by means of a fixed projection (13), also in the form of a slide, designed in the corresponding assembly casing or chassis of the disc unit, pushing each scraper (9) through its flange (11).

[0021] With regard to the "auxiliary support marguerite" comprising part (3), this is also formed by a central core with a central passage (3') for its assembly attached to the marguerite or part (2), with the aforementioned part (3) including as many radial arms (14) as the marguerite (2) has (8) and slots (5) as the disc (1) has. Part (3) is made of sheet metal, with each arm (14) a metal strip inalterable in shape and by means of which the scrapers maintain their stability supported on the same.

[0022] As previously mentioned, by the disc rotating (1) and pulling the coins (7) between the scrapers (9) protruding through the slots (5), each time a scraper (9) in its rotational movement meets the trigger slide (12), it will withdraw beforehand, passing beneath the projection (13) and freeing itself up once again. For this, the projection that forms the slide (13) converges with the flange (11) of the scraper (9). This is realised in such a way that the disc (1) during its rotation makes each scraper (9) pass the same set point forcing them to withdraw and freeing themselves up after completing a sector of the circumference. This projection or fixed point is designed in the shape of an extended slide (13), positioned in accordance with the arc going around the scrapers (9) in its external circumference.

Claims

1. Hopper, which is for use in amusement and coin-and-token-operated machines, wherein the return of coins or tokens is realised by the rotation of a disc modulated by radial slots whose distance is equal or greater than the diameter of the coins, through these slots protrude scrapers that overhang with regard to one of the faces of the revolving disc or plate

to pull the coins when rotating, each scraper withdrawing when a fixed trigger slide is reached, by means of which coins are diverted towards a coin guide slot, **characterised in that** scrapers (9) designed in relation to each slot (5) of the revolving disc (1), are formed on the same part (2), assembled next to the corresponding revolving disc (1), with the scrapers (9) being maintained on the slots (5) of this disc (1) by means of a third part (3) assembled on part (2) in which the scrapers (9) are formed, these scrapers (9) being designed to form part of a plurality of radial elastic arms (8) protruding from a central core of the part (2) by means of which the assembly on the centre of the revolving disc is achieved (1), while the maintenance part (3) of the position of the scrapers (9) in the slots (5) includes other arms (14) equal in number to the radial elastic arms (8) where the scrapers (9) are.

2. Hopper as claimed in claim 1, **characterised in that** on the general assembly chassis of the revolving disc (1) a projection in the form of an extended and raised slide (13) has been designed whose path is the same as the circumference of the rotation of the scrapers (9), the slide (13) faces a flange (11) designed at each end of the scrapers (9), which affects the slide (13) to cause the withdrawal of the scraper (9) in relation to the slot (5) of the disc (1) and enable the diversion of the coin (7) by means of a trigger slide (12) towards the corresponding coin guide slot.
3. Hopper, as claimed in the preceding claims **characterised in that** the revolving disc (1), as well as the supporting part (2) of the elastic radial arms (8) and the supporting part (3) of the radial arms (14) for the scrapers (9) of the part (2), form a single, revolving unit.

Patentansprüche

1. Hopper, der für den Gebrauch in Spielautomaten und mit Münzen und Spielmarken betriebenen Automaten ist, wobei die Rückgabe der Münzen oder der Spielmarken durch Drehung einer Scheibe erfolgt, die durch einen radialen Schlitz, dessen Abstand dem Durchmesser der Münzen entspricht oder größer als dieser ist, moduliert ist, durch diese Schlitz ragen Abstreifer heraus, die hinsichtlich zu einer der Seiten der Drehscheibe oder -platte hervorsteht, um die Münzen beim Drehen vorwärts zu schieben, wobei jeder Abstreifer zurück gezogen wird, wenn ein fester Auslöse-Schieber erreicht wird, wodurch die Münzen zu einem Münzführungsschlitz umgeleitet werden, **dadurch gekennzeichnet, dass** die Abstreifer (9), die für jeden Schlitz (5) der Drehscheibe (1) gestaltet sind, auf demselben

Teilstück (2) gebildet sind, gleich neben der entsprechenden Drehscheibe (1) montiert sind, wobei die Abstreifer (9) durch ein drittes Teilstück (3), das auf dem Teilstück (2), auf dem die Abstreifer (9) gebildet sind, auf den Schlitzen (5) dieser Scheibe (1) gehalten werden, wobei diese Abstreifer (9) gestaltet sind, um einen Teil der Vielzahl von aus dem Zentralkern des Teilstücks (2) hinaus ragenden, radialen, elastischen Armen (8) zu bilden, wodurch der Zusammenbau in der Mitte der Drehscheibe (1) erreicht wird, während das Teilstück (3) zum Halten der Position der Abstreifer (9) in den Schlitzen (5) andere Arme (14), in der gleichen Anzahl wie die radialen, elastischen Arme (8), an denen sich die Abstreifer (9) befinden, beinhaltet.

2. Hopper nach Anspruch 1, **dadurch gekennzeichnet, dass** auf dem allgemeinen Zusammenbau-Chassis der Drehscheibe (1) ein Überstand in Form eines ausgefahrenen und angehobenen Schiebers (13) gestaltet wurde, dessen Bahn die gleiche wie der Umkreis der Drehung der Abstreifer (9) ist, der Schieber (13) verkleidet eine Flansch (11), die an jedem Ende der Abstreifer (9) gestaltet ist, was sich auf den Schieber (13) auswirkt, um das Zurückziehen des Abstreifers (9) hinsichtlich des Schlitzes (5) der Scheibe (1) zu bewirken und die Ablenkung der Münze (7) durch einen Auslöse-Schieber (12) zu dem entsprechenden Münzführungsschlitz zu ermöglichen.
3. Hopper nach den vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** die Drehscheibe (1) sowie das Stütz-Teilstück (2) der elastischen, radialen Arme (8) und das Stütz-Teilstück (3) der radialen Arme (14) für die Abstreifer (9) des Teilstücks (2) eine einzige Dreheinheit bilden.

rainures (5) dudit plateau (1) au moyen d'une troisième pièce (3) montée à côté de la pièce (2) où sont réalisées les pales (9); et il a été prévu que lesdites pales (9) fassent partie d'un ensemble de bras élastiques radiaux (8) émergents d'un noyau central de la pièce (2) au travers duquel s'effectue le montage au centre du plateau pivotant (1), tandis que la pièce (3) maintenant la position des pales (9) dans les rainures (5) comprend autant d'autres bras (14) de nombre identique à celui des bras élastiques radiaux (8) où se matérialisent les pales (9).

2. Changeur de monnaie, selon la revendication 1, **caractérisé en ce qu'il** a été prévu sur le boîtier général de montage du plateau pivotant (1) une saillie sur la rampe allongée et arquée (13) dont le parcours correspond à la circonférence de rotation des pales (9), la rampe (13) est située en face d'un ressaut (11) prévu sur chaque extrémité des pales (9), tombant sur la rampe (13) afin de permettre le retrait de la pale (9) par rapport à la rainure (5) du plateau (1) et permettre la déviation de la pièce de monnaie (7) correspondante au moyen de la rampe-butée (12), vers le canal correspondant du change.
3. Changeur de monnaies selon les revendications précédentes, **caractérisé en ce que** le plateau pivotant (1) ainsi que la pièce (2) portant les bras radiaux élastiques (8) et la pièce (3) portant les bras radiaux (14) appuient sur les pales (9) de la pièce (2), forment un ensemble unique et pivotant.

Revendications

1. Changeur de monnaie, applicable aux machines à jeux et automatiques fonctionnant à monnaies ou à jetons, où le change de ces derniers s'effectue par rotation d'un plateau pourvu de rainures radiales dont la distance est égale ou supérieure au diamètre des propres monnaies, et où émergent des rainures autant de pales ressortant par rapport à une des faces du disque ou du plateau pivotant pour l'entraînement des monnaies par rotation, et chacune des pales se retire une fois la rampe-butée fixe étant atteinte au moyen de laquelle la déviation des monnaies est possible vers un canal d'échange, **caractérisé en ce que** les pales (9) prévues en correspondance à chacune des rainures (5) du plateau pivotant (1) sont réalisées en une seule pièce (2) qui se monte à côté sur le correspondant plateau pivotant, les pales (9) étant maintenues dans les

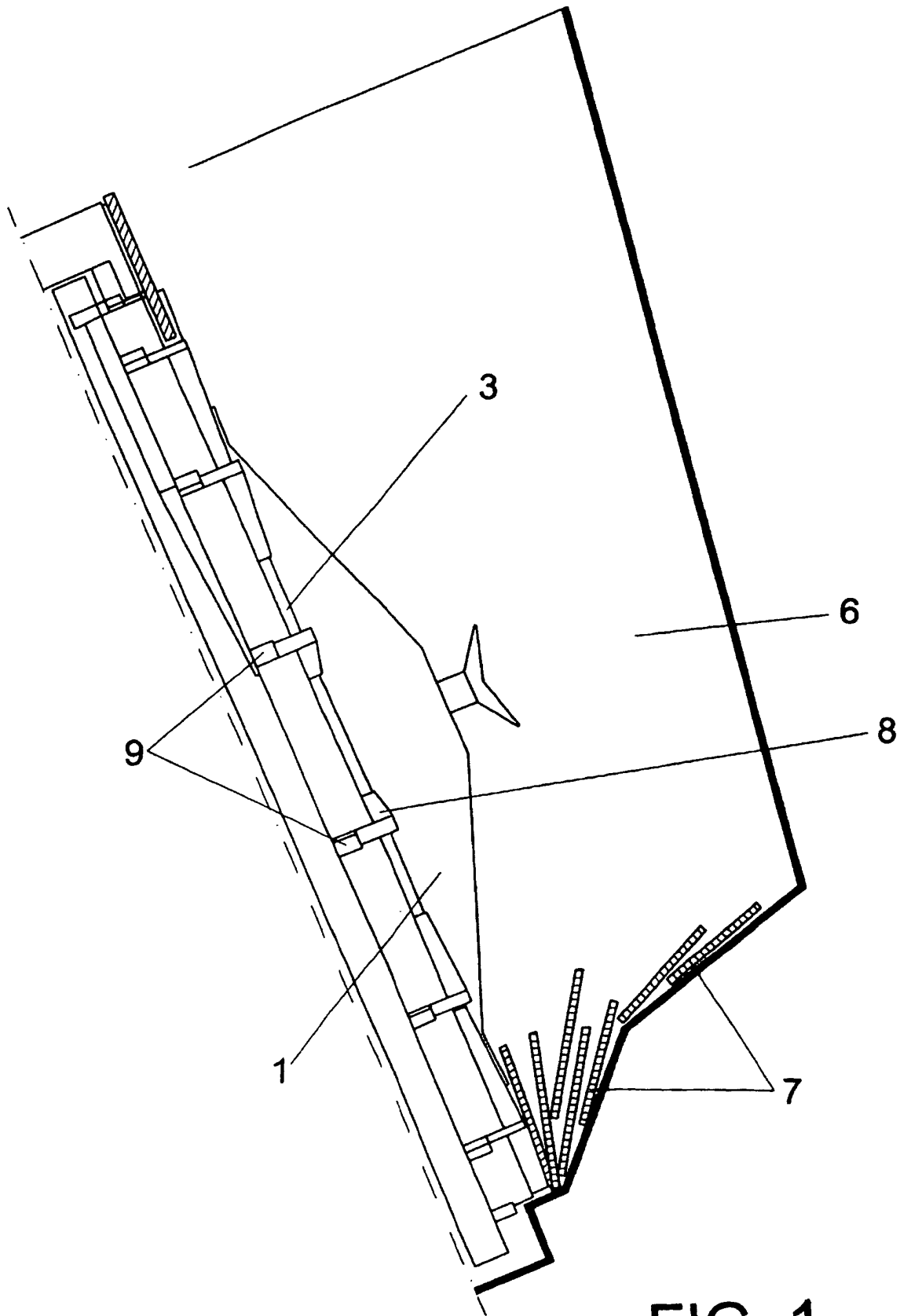


FIG. 1

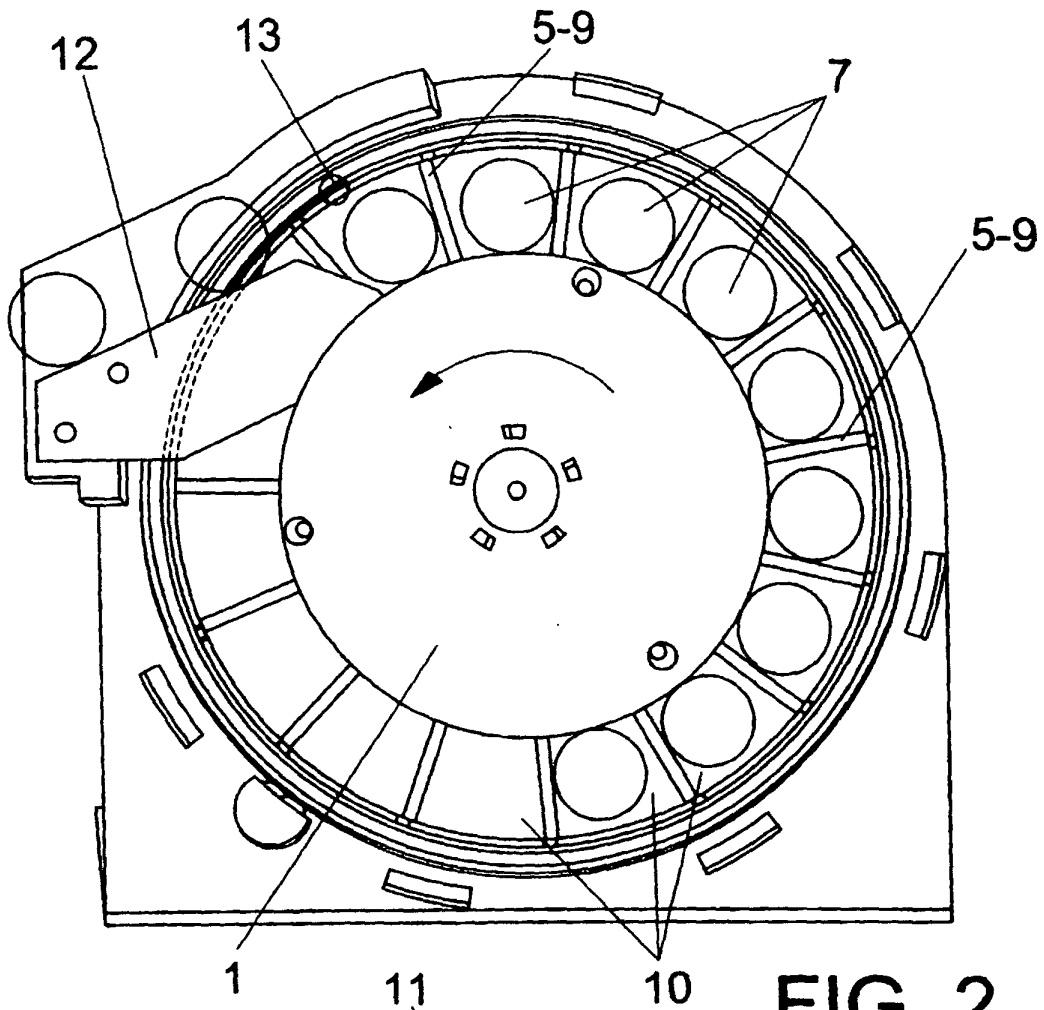


FIG. 2

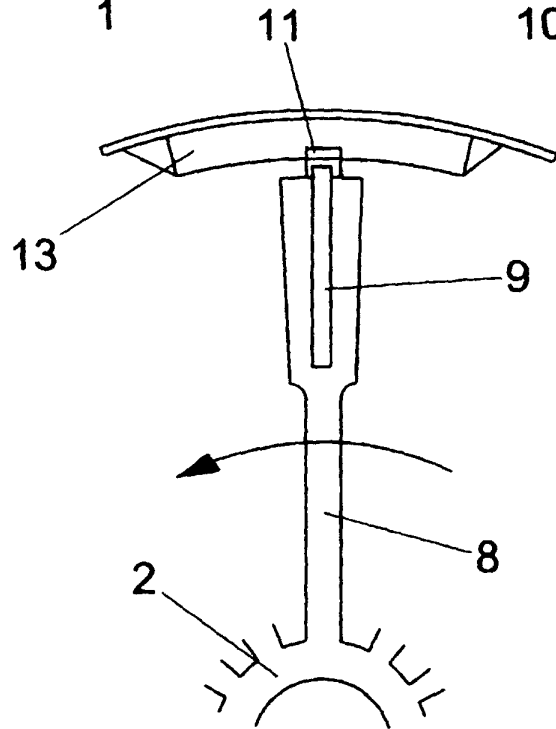


FIG. 3

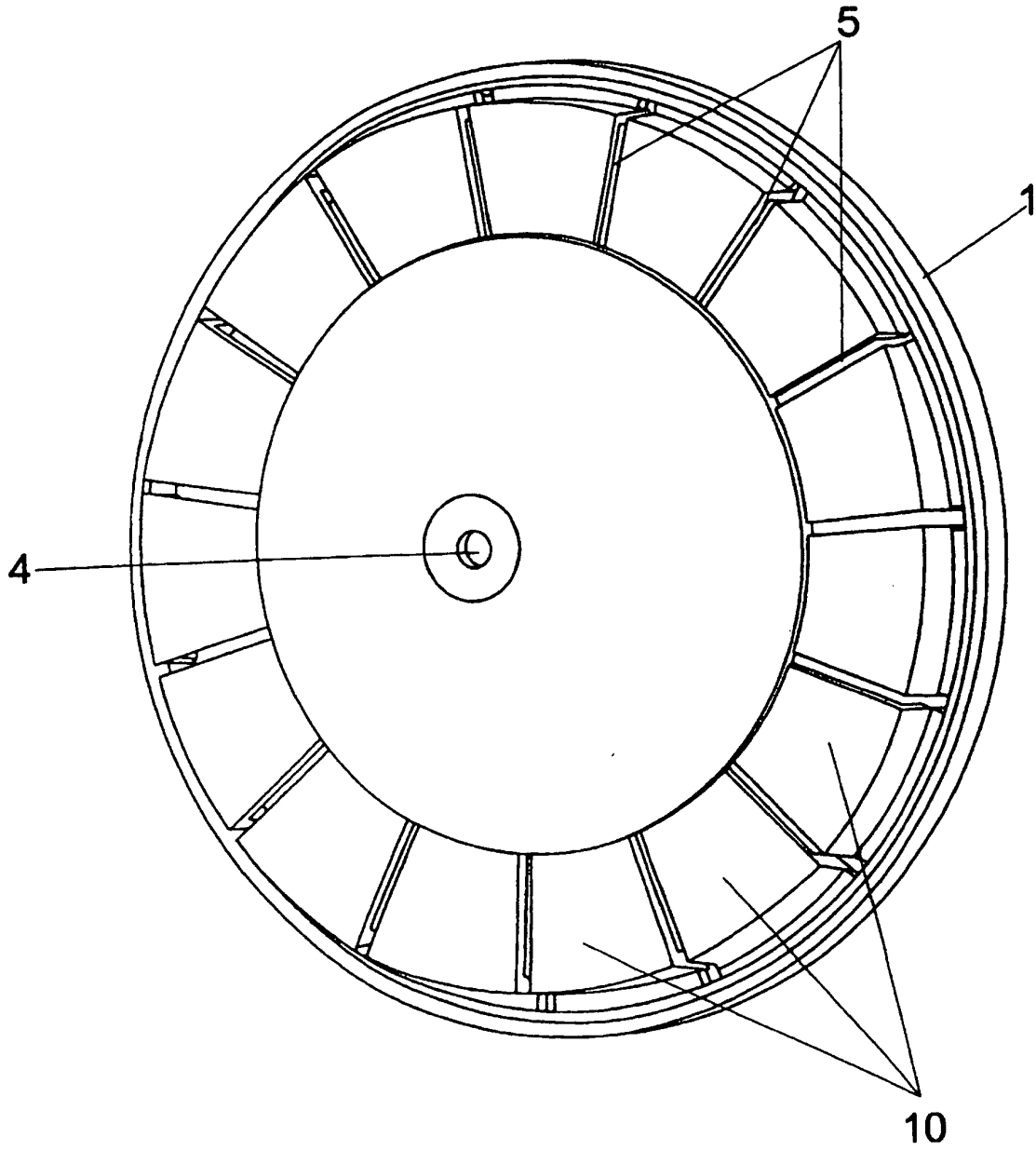


FIG. 4

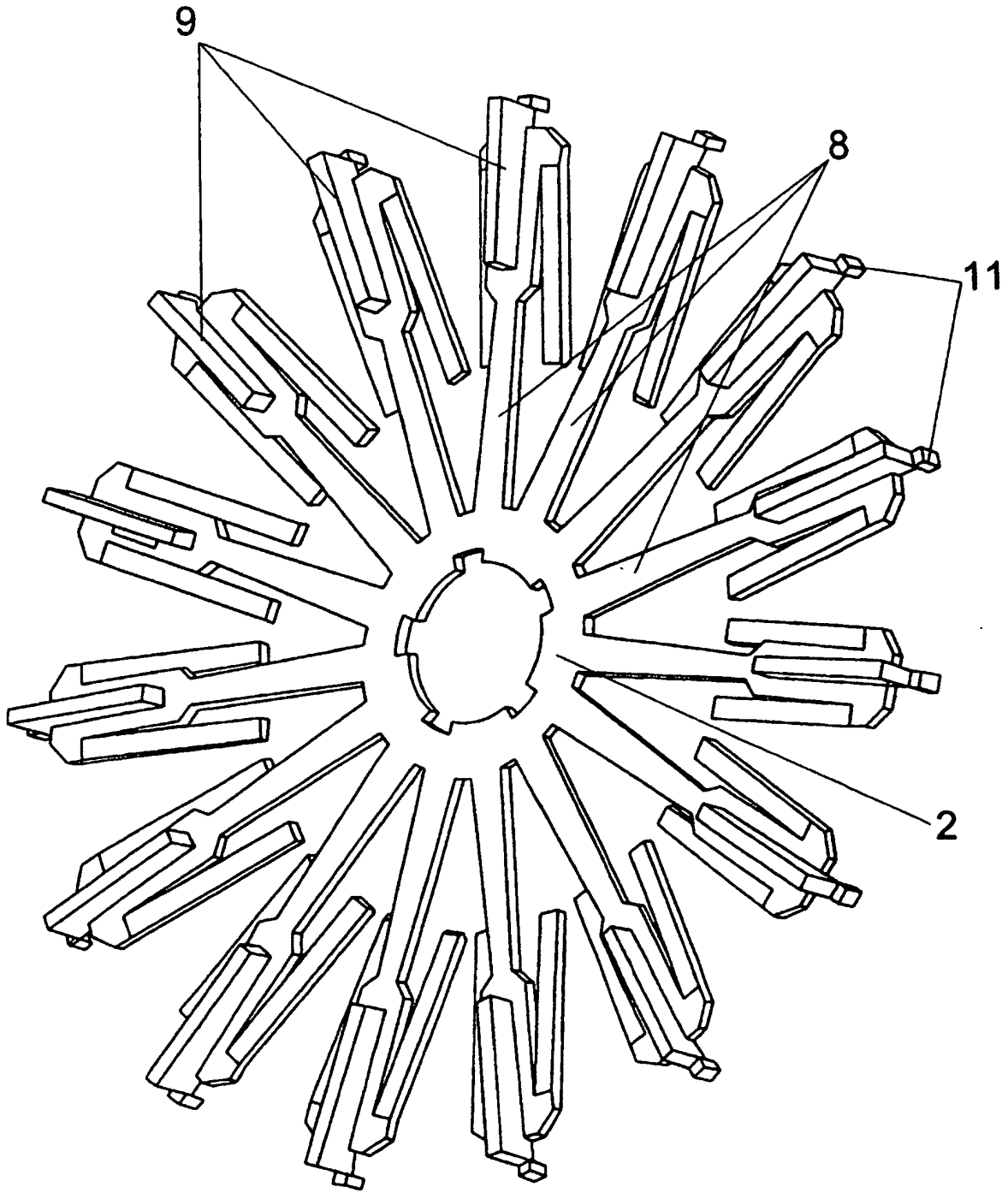


FIG. 5

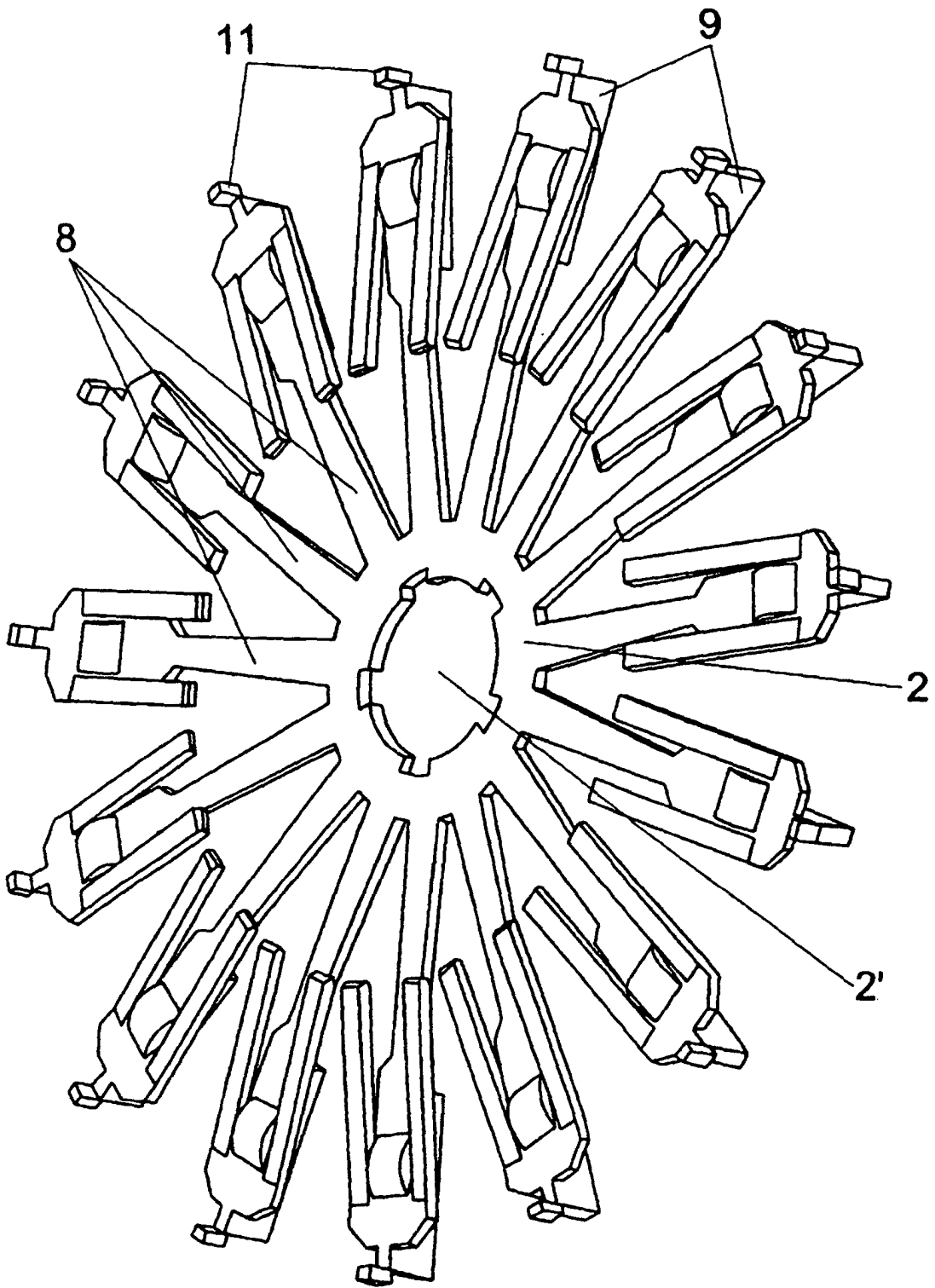


FIG. 6

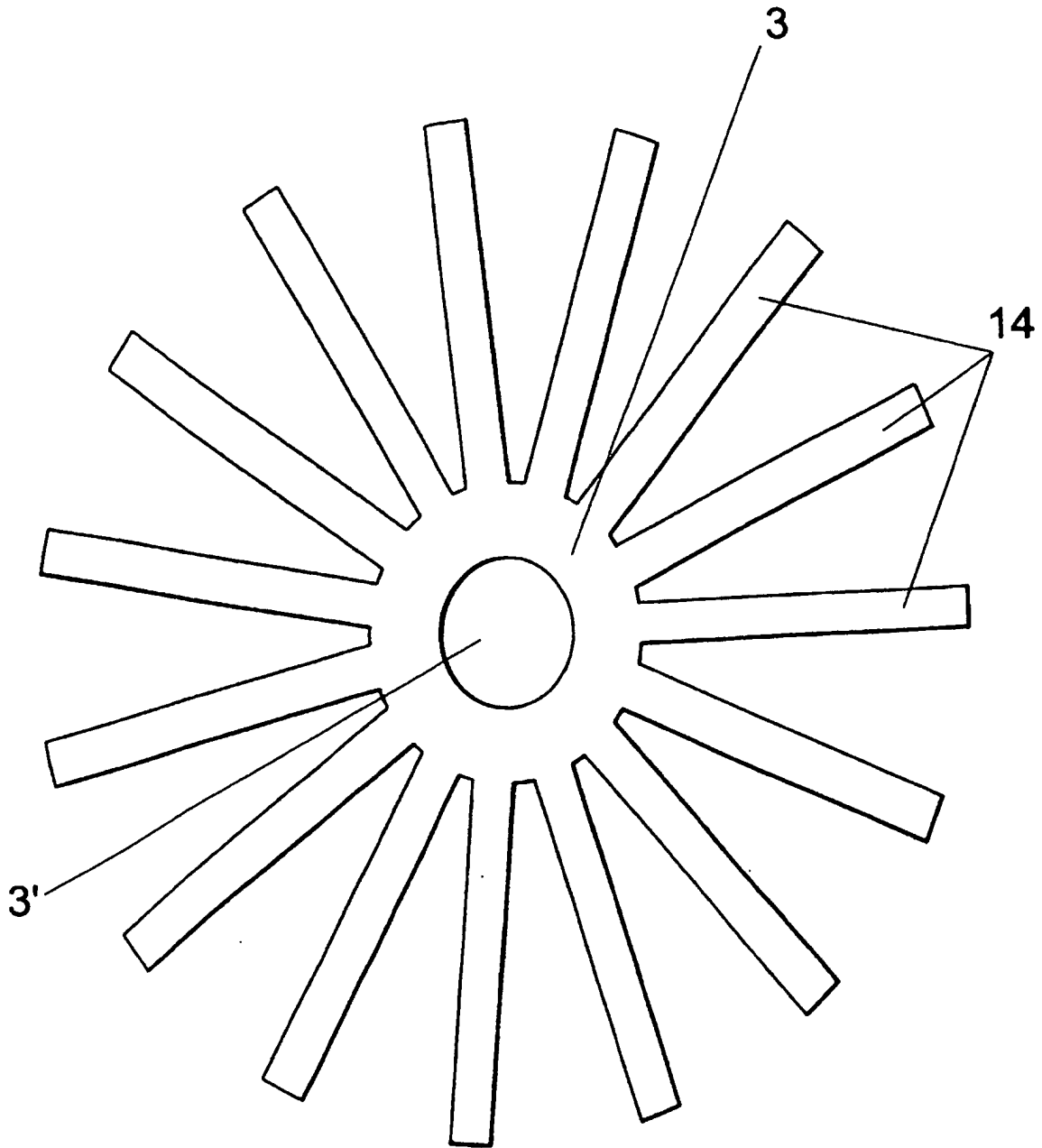


FIG. 7