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(54) Hopper

(57) The hopper, which is for use in coin-operated machines, includes a revolving unit attached to a wall of the corresponding coin container. The unit is formed by a revolving disc (1) with radial slots (5) wherein the scrapers (9) belonging to the second part (2) are positioned. This part is formed by a plurality of elastic and radial arms (8) protruding from a central core which is attached to the disc (1) forming the aforementioned scrapers (9) projecting on one side of the faces of the disc (1) in order to pull the coins when the disc rotates. The third part (3), formed by as many radial arms (14) as elastic arms (8) as the piece (2) has, is attached to this, maintaining the position of the scrapers (9) on the interior of the slots (5). When rotating, a projection or flange (11) designed at one end of the scrapers (9) reaches a fixed slide (13) causing the withdrawal of the corresponding scraper (9) and the exit of the coin (7), which is diverted by a trigger slide (12) towards an exit canal. The part (2), together with the part (3), which act as a support and spring for the part (2), form, in their assembly on the revolving disc (1), a single unit.

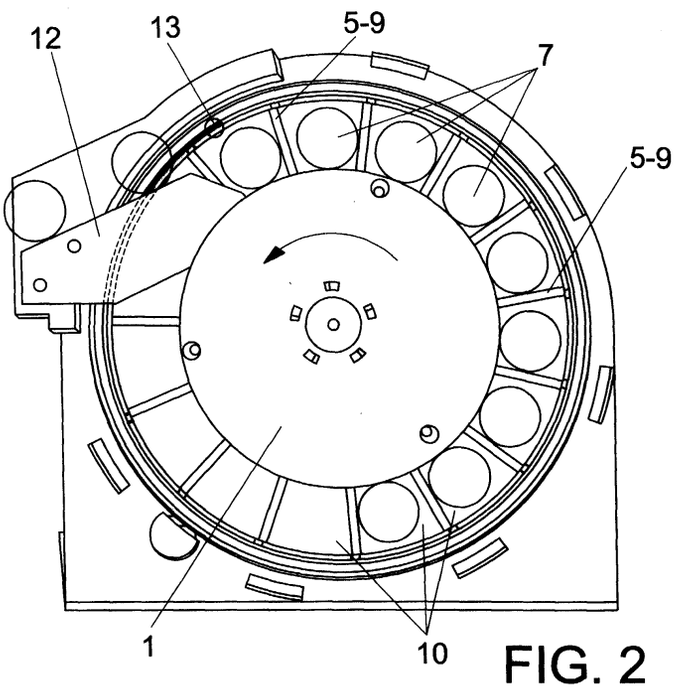

FIG. 2

EP 1 387 328 A1

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-scraper 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 blockages 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 projections. In consequence, the disc would rotate without any obstacle, with the jam being removed and the scrapers 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 beneath 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 completing a sector of the circumference, which is modulated 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.

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 enclosed 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 revolving 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-scraper 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-scraper marguerite 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 invention.

Preferred embodiment of the invention

[0018] In view of the igures 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 container (6) of the coins (7), as shown in figure 1 and whose container (6), disc (1) and naturally parts (2) and (3) attached to it, will be situated in a semi vertical position, slightly sloping towards the exterior.

[0019] The part (2) known as "multi-scraper marguerite" 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 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 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 of the elastic radial arms (2) and the supporting part of the radial arms (14) for the scrapers (9) of the part (2), form a single, revolving unit.

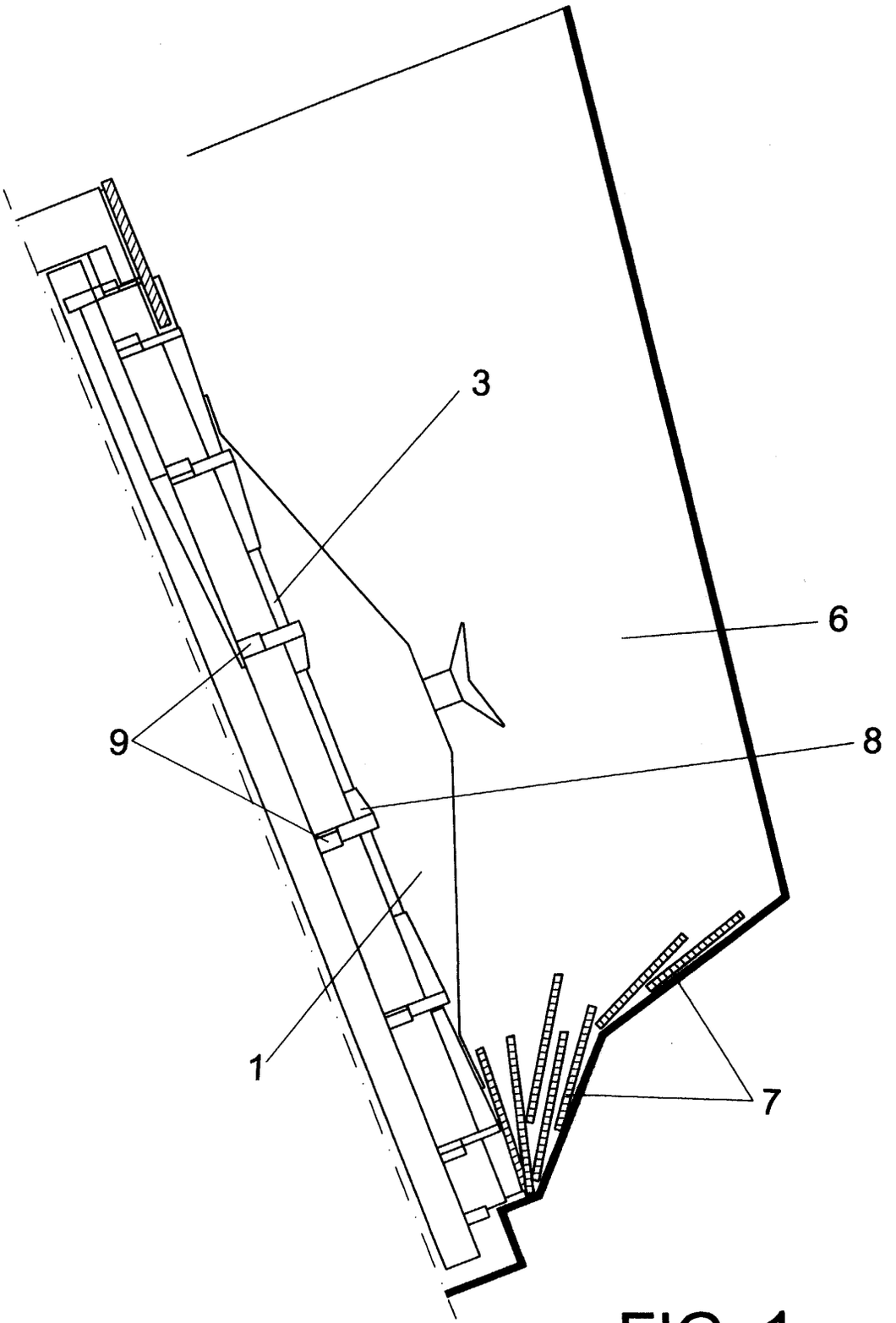

FIG. 1

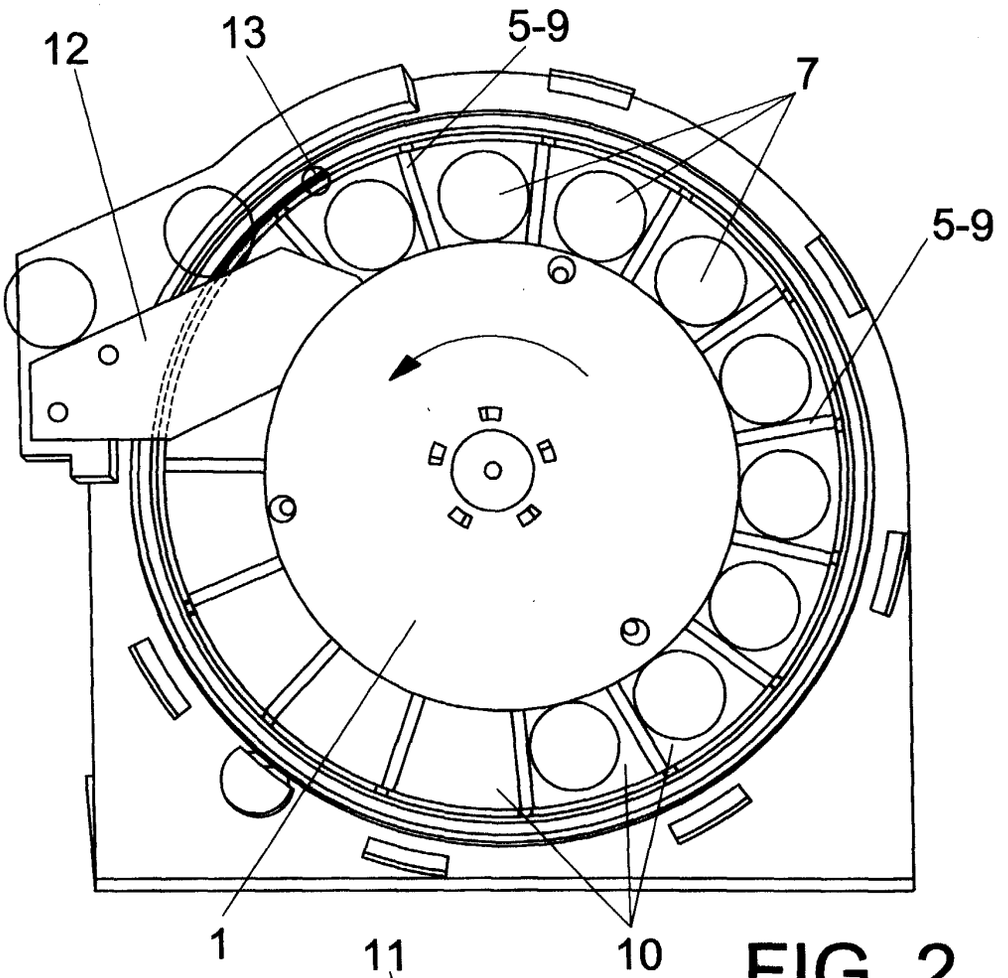

FIG. 2

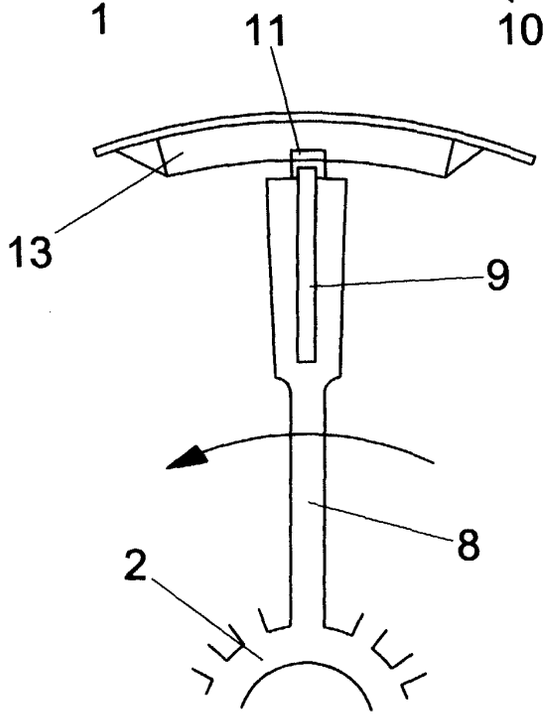

FIG. 3

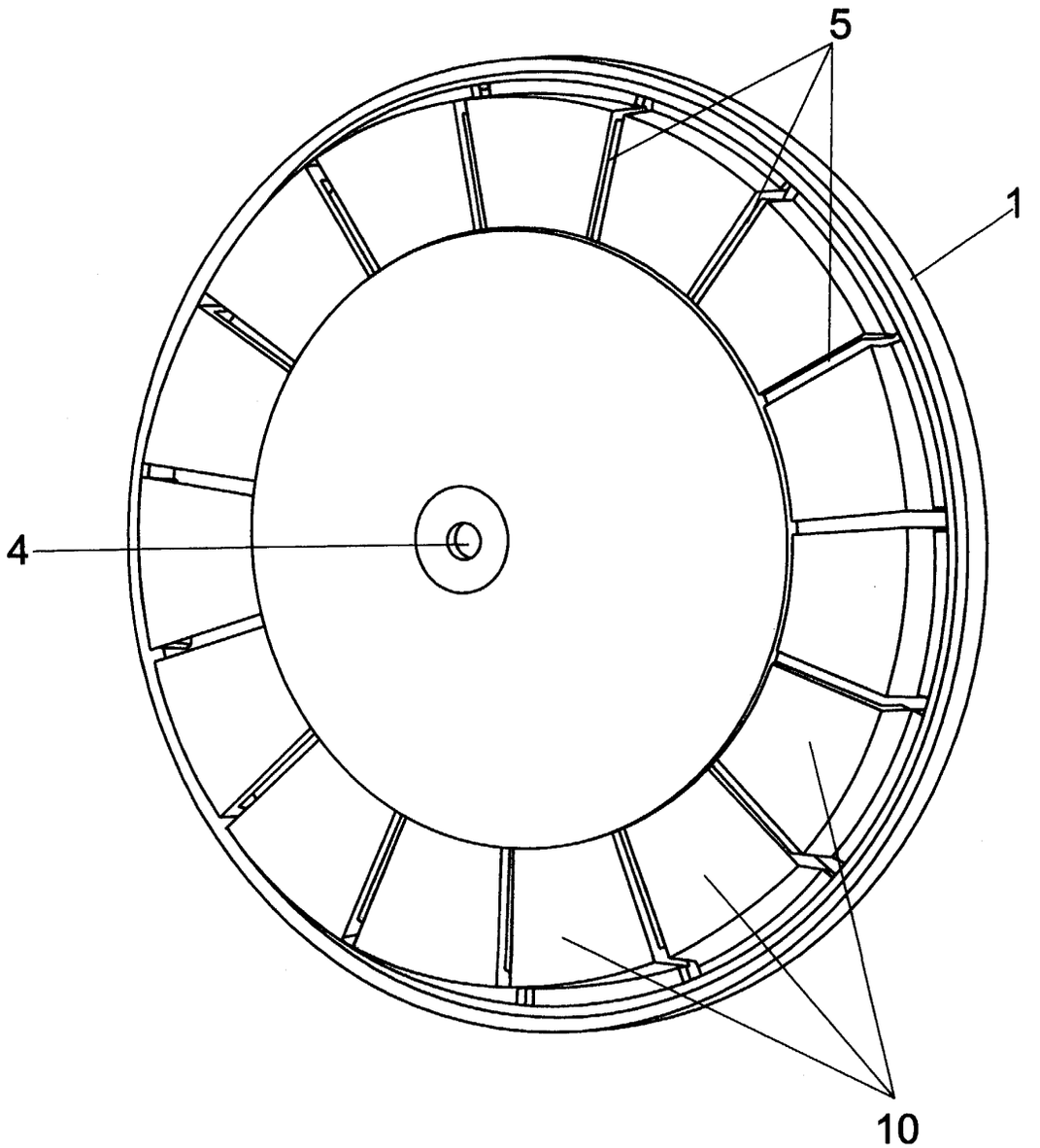

FIG. 4

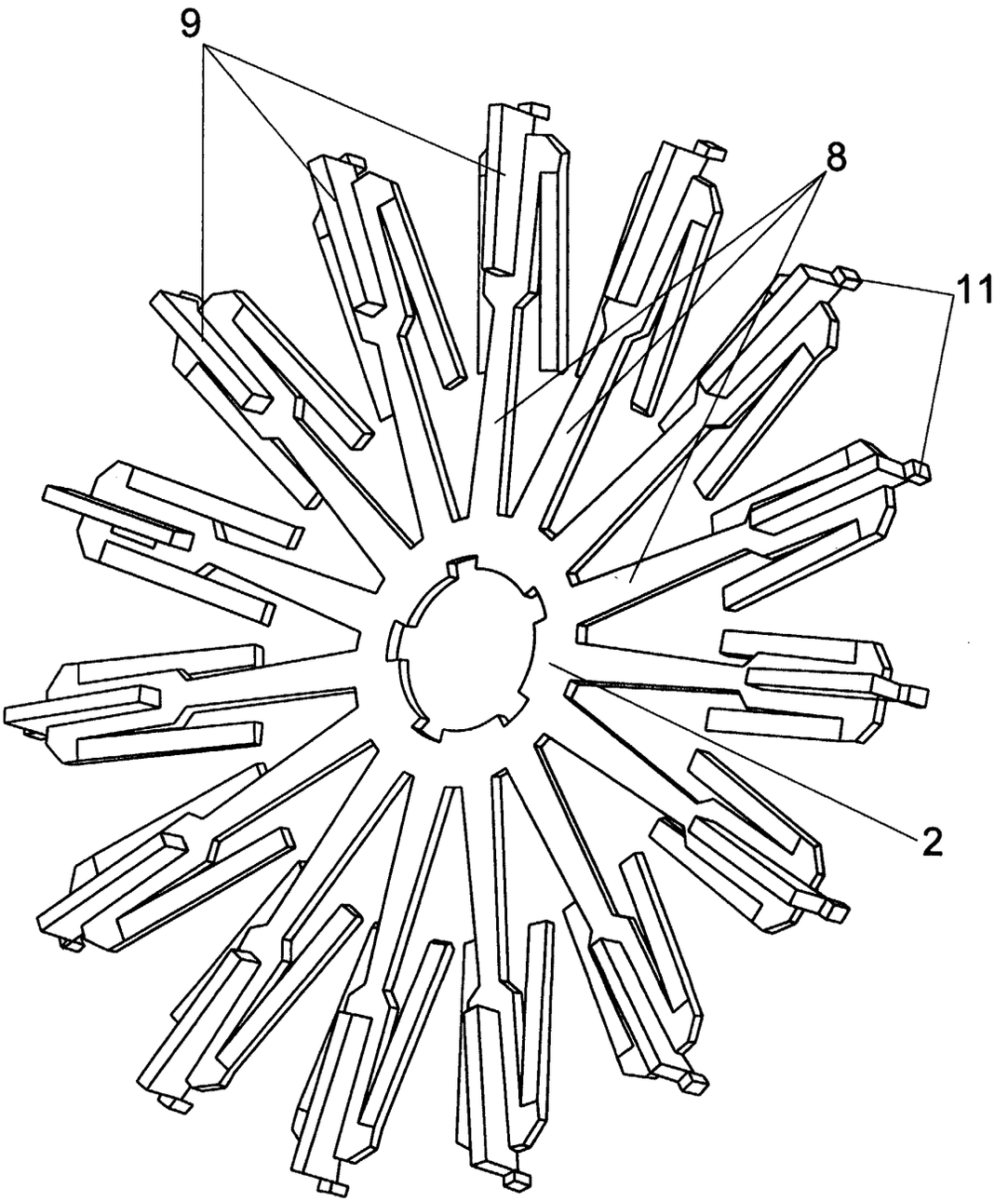

FIG. 5

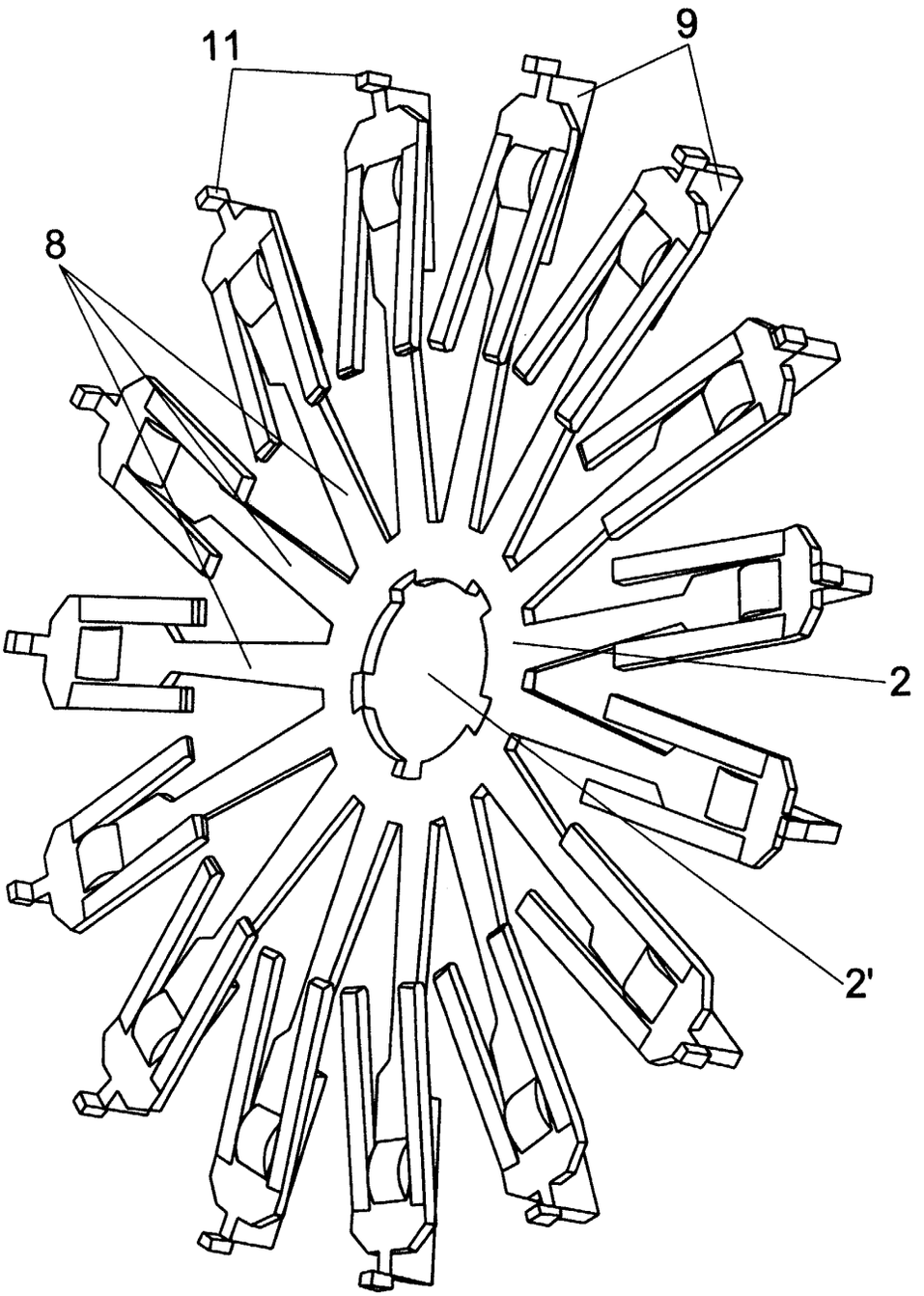

FIG. 6

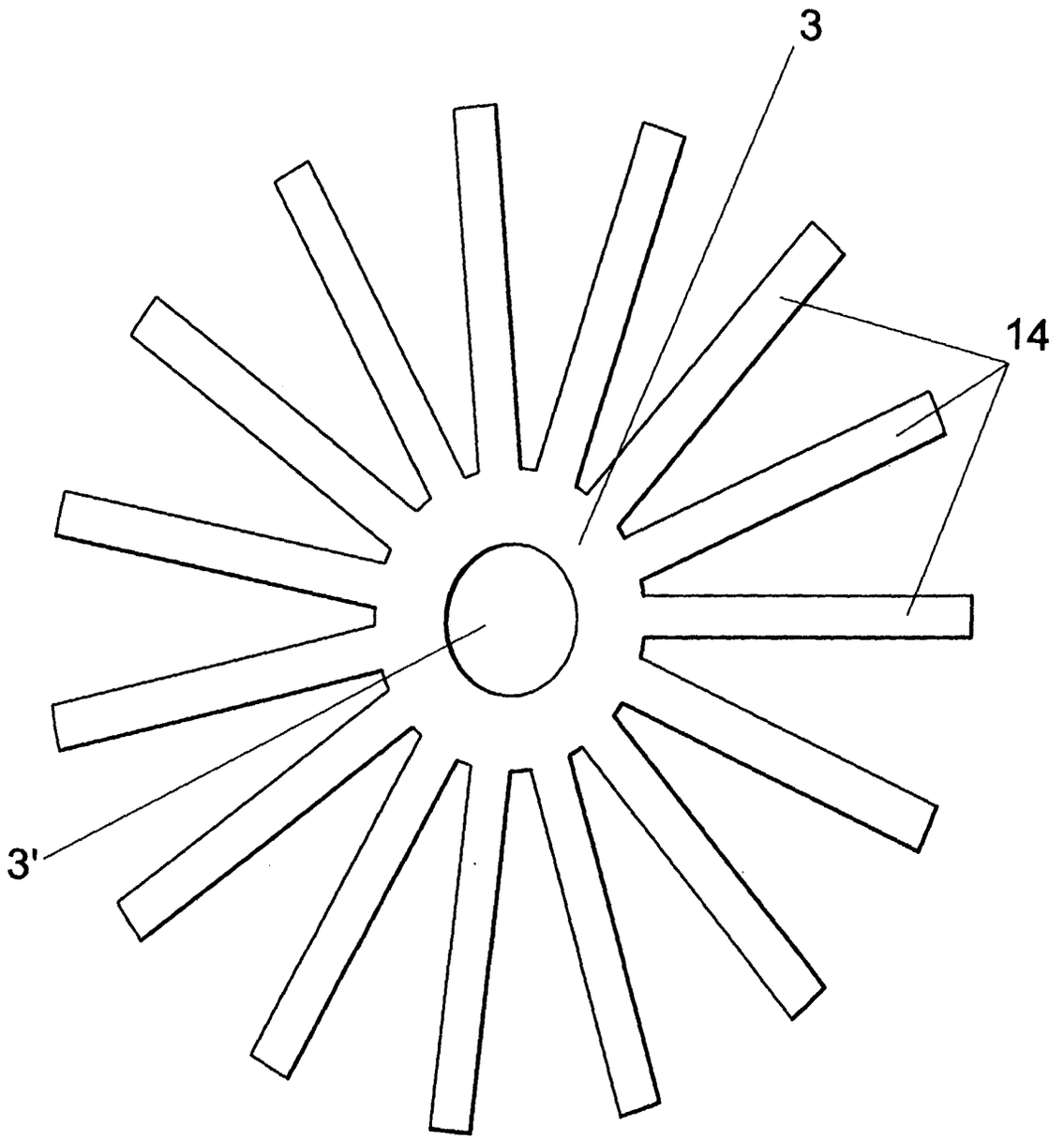

FIG. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 38 0179

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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

G07D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	13 November 2003	MÜLTHALER, E

CATEGORY OF CITED DOCUMENTS

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