ABSTRACT: A cover device for a waste receptacle or the like, made of molded plastic and having a housing and pivotally mounted cover members rotative essentially in a horizontal plane into and out of the housing. A pair of such cover members are provided, each mounted on a slightly tilted axis so as to be biased out of the housing to closing position, and having engageable sides to effect full closure of a receptacle. The covers are swung by manual force into the housing by a camming action, effecting horizontal thrust, when a hand or object is pushed downwardly against the cover members at the plane of engagement.
The receptacle lid structure comprising a base ring which can rest on the top rim of a receptacle such as a waste basket, laundry hamper, or the like. The structure has a semicylindrical housing that has a diametric opening. A pair of quadrant cover members are carried on respective pivot structures adjacent the opening, each pivot structure being tilted on an axis of 1° to 10° from vertical in a direction such that the respective cover members gravitate to a position to effect a complete cylindrical configuration in conjunction with the housing, fully closing the top of the receptacle.

The cover members engage each other in a plane perpendicular to the plane of the opening and their surfaces extending from the plane of engagement are curved in a cam shape. Thus, an object, or hand thrust against the covers and moving downwardly will cause the covers to be pushed away from each other horizontally so that a large opening is effected to permit access of objects into the receptacle. Upon removal of the downward force, the cover members automatically gravitate to close the receptacle.

The construction is such that all components can be structurally strong and economically made by injection molding. A detailed description now follows in conjunction with the appended drawing in which:

FIG. 1 is a perspective of the base ring and housing portion of the lid;
FIG. 2 is a perspective of the entire lid device showing the cover members assembled to the housing and in receptacle closed position;
FIG. 3 is a rear view perspective of a quadrant cover member;
FIG. 4 is a plan fragmentary view from the bottom of the lid device;
FIG. 5 is a vertical partial section in elevation taken generally through the plane of engagement of the cover members.

Referring to the drawing, a receptacle lid 10 is fragmentarily illustrated which may be a waste basket or other type of container having an open top on which rests a cover device 15 having a circular or ringlike base 18 angularly flanged as shown in FIG. 5 to seat on the top rim of the receptacle. An integral semicylindrical housing 22 rises upwardly from base 18, which housing has a diametric opening 25, for substantially the entire vertical cross section, the opening being peripherally reinforced by flange 28 and 31. At approximately a central portion of the structure, top 35 of the housing adjacent opening 25 has an aperture 36 into which is inserted and secured a trunnion socket member 41 having molded bosses 43 which are internally hollow to take upper trunnion pins such as the pin 48 (FIG. 3) of shell-like panels or closure members of quadrant shape, there being two such closure members 52 and 56 as shown in FIG. 2. The cover members are of light but strong plastic molded construction, and are mirror images of each other, i.e., a right and a left, and accordingly the same reference numerals are used to designate like parts of the cover members.

Integrally molded with the top wall of the housing is a depending bracket 60 having molded bosses 63 which are hollow to effect trunnion sockets for cover member lower trunnion pins such as 68, FIG. 3, which are axially aligned with their upper counterpart trunnion pins 48 as will be readily understood from the drawing. The axes of the socket pairs 43 and 63 are tilted slightly forward at an angle A of some 1° to 10° from vertical as shown in FIG. 5 so that the cover members are wholly carried by respective tilt means and gravitationally biased out of housing 25, swinging freely on the pivotal mounts thus provided by the respective trunnion pins and sockets. Thus, the cover members are carried on forwardly tilted pin means so as to be weight biased to a position out of housing 25 as illustrated in FIG. 2, although as will be presently described, they can be actuated into the housing by a force exerted downwardly on them.

The bracket 60 is suitably rigidified and reinforced by a radial rib 74 of generally U-shape so as to extend up the back of the bracket and across the housing top as illustrated in FIG. 1. Thus it will be apparent that the entire cover device 15 can be an integral molding except for the trunnion socket cap 41 which as a manufacturing convenience can be a separate piece to be inserted in aperture 36 and of any suitable design to securely fit within the aperture with locating ears such as 78 engaging the edge internally of the aperture. Cap 41 can then be seated in place or it can be designed to clip into place. However, practical commercial samples have utilized cemented caps.

It should be noted that bracket 60 can also be a separate piece cemented in aperture 38 and to rib 74. A further integral element of the base 18 is a semicylindrical flange 82 which serves as a guard shoulder for the rounded portion of the cover members 52 and 56 at their lower edges. As will be apparent from FIG. 3 the cover members do not actually touch the shoulders 82 and they swing entirely clear of any frictional engagement with the base 18 or the housing 22. Thus, the pin-type means described above forms the sole support for the cover members and the angle of inclination A, even though slight, is sufficient to permit the cover members to swing by gravity to a position as shown in FIG. 2 wherein, in conjunction with the housing, the cover members form a complete closure for the top of the receptacle.

Referring now to FIG. 3, it will be noted that the closure member 52 illustrated is of generally quadrant shape, having an exterior circular wall 85, a flat side wall 88, a downwardly curved cam shaped top wall 92, and being substantially open at the rear wall 95.

Suitable framing flanges form an arch 98 around the edges of walls 85, 88 and 92 for rigidity and as a matter of fact the arch thus formed constitutes the only rear wall surface of the cover member. A small upstanding flange 102 further rigidifies the structure and also serves as a stop (FIG. 5) by engaging against downwardly extending front flange 31 at the top of the opening 25 of the housing. Each of the cover members has such a flange 102 so that in cover closed position the meeting plane of the cover members as indicated by crevice 108 (FIG. 2) extends radially from the housing and normal to the front flange 31, presenting a symmetrical appearance. Such meeting plane is demarcated by engagement of the flat triangular sidewalls 88 of the cover members and the sidewalks are flat in order to effect a contiguous surface rather than merely a meeting of contiguos edges. Such feature effects a better and more sanitary closure and one less likely to permit dust to sift out of the receptacle if it is used for trash or waste.

Referring now to the cam shape walls 92 of the cover members it will be noted that they effect the crevice 108 (FIG. 2) in the closed position, such crevice terminating in a line which marks the lowest exposed areas of the walls 92, being the upper line of meeting of the flat triangular side walls surfaces 88, as will be readily appreciated by comparing FIGS. 2, 3 and 5. Accordingly, if a person's hand or anything carried in a person's hand is pushed downwardly in the direction of the arrow B into the crevice, horizontal thrust components will be effected in the directions of the arrows C and D which will swing the cover members 52 and 56 away from each other and into the housing 25. Articles may be deposited in the receptacle in that manner. Upon removal of the housing top the cover members readily gravitate back to the closed position.

Referring again to FIG. 3, each entire cover member is an integral molding including the trunnion pins and their bracing members 115. Further, extending from the rear wall arch 98, is a stop member 115 which as shown in FIG. 4, can abut the rib 74 of the top of the housing to limit the maximum downward swing of the respective cover members. In FIG. 4 cover member 52 is shown, from a bottom view, within the housing and cover member 56 is shown as being outside the housing for purposes of illustration only, being understood that both cover members would either be inside or outside the housing.

As a matter of assembly, the cover members can be articulated to the housing by virtue of the innate flexibility of the
housing material. Thus, a slight bending upwardly of the top wall of the housing is sufficient to permit the trunnion pins to be disposed in the respective trunnion sockets.

From the foregoing description it will be apparent that the construction is rugged, simple and economical as well as attractive in appearance. The convenience of the invention in use will likewise be apparent, in particular, the automatic closing and discarding of the opening feature without mechanism of any kind such as levers, linkages and the like normally associated with structures having the functions of the present invention.

It will, of course, be recognized that the cover members while having a substantially horizontal motion which, in fact, appears fully horizontal to the casual observer, must have a slight downward movement in gravitating to closed position due to the inclination of the slanted pintle means. However, since the angle of the pivoting axis is only up to $10^\circ$, (or less) for all practical purposes, the motion of the cover members is horizontal and the thrust force on the sloping cam surfaces affects substantially horizontal components for separation of the cover members.

The sidewalls of the cover members, in addition to providing an effective closure of meeting surfaces, also has the advantage of providing smooth plastic surfaces against which objects or a person's hand can readily engage with sliding contact as compared with an edge closure arrangement which would be very difficult to maintain in registry in closed position as well as presenting possibilities of catching against and scratching the skin.

It will be appreciated that the invention can be practiced with various shaped of receptacles and cover structures, i.e., the invention is not limited to cylindrical configurations. Thus, the broad concept of a slightly inclined axis means which support substantially horizontally movables cover means could be utilized for various shapes of cover means designed to overhang a receptacle top. Further, the cover members need not necessarily be quadrants of a circle, but could be greater or less than $90^\circ$. For example, they could be nearly as large as $180^\circ$ provided one cover member were made slightly larger in inner and outer radius so that the other cover member could rotate telescopically into it at the rear when they were moved apart at the crevice. The heights could be the same if the trunnion sockets of the larger cover member were displaced to a slightly lower level to prevent swinging interference; or if kept at the same level the outer cover member would have an increased height. In either case, the housing could be reduced to the point where it would have an overhanging arm for the purpose of supporting a bracket for the inclined pintle means.

1. A receptacle cover device comprising:
   a housing having a wall with an opening; pivot cover means movable in a substantially horizontal plane into and out of said opening; and said pivotal cover means having pintle means disposed to pivotally support said cover means in position to be swung into said housing by an external force; said pintle support means having a pivotal axis slightly inclined to the vertical to thereby effect a gravitational return motion of said cover means upon release of said external force.

2. A receptacle cover device as set forth in claim 1, said housing comprising a ringlike base to be set on a receptacle, said housing effecting a cover for a predetermined portion of the area encompassed by said base, and said cover means effecting a cover for the remaining portion of the area encompassed by said base.

3. A receptacle cover device as set forth in claim 1, said cover means comprising a pair of panels; and said pintle means comprising respective trunnions for said panels; said housing having respective trunnion sockets disposed adjacent a central portion of said opening and said panels being wholly supported by respective trunnions in said sockets, and having respective walls normally gravitationally engaging each other outside said housing.

4. A receptacle cover device as set forth in claim 1, said housing comprising:
   a ringlike base to be set on a receptacle, said housing effecting a cover for a predetermined portion of the area encompassed by said base, and said closure means effecting a cover for the remaining portion; said closure means comprising a pair of panels; and said pintle means comprising respective trunnions for said panels; and said housing having respective trunnion sockets disposed adjacent a central portion of said opening and said panels being wholly supported by respective trunnions in said sockets and having respective walls normally gravitationally engaging each other outside said housing.

5. A receptacle cover device as set forth in claim 1, said device comprising:
   a base to be set on a receptacle, said housing effecting a cover for a predetermined portion of the area encompassed by said base, and said closure means effecting a cover for the remaining portion; said closure means comprising a pair of shell-like members having top and side walls, and each member being approximately a quadrant of a circle; and said top walls having sloped cam surfaces merging downwardly into respective side walls and said side walls being in gravitational engagement with each other external of said housing to form a crevice for receiving thrust of a downwardly moving object to effect a sidewise camming force on said members to swing said members away from each other for effecting an opening into a receptacle.

6. A receptacle as set forth in claim 1, said closure means comprising a pair of shell-like cover members; said pintle means comprising respective trunnions on said cover members; said housing having respective trunnion sockets and said cover members being wholly supported by respective trunnions in said sockets and having respective side walls normally gravitationally engaging each other outside said housing to effect in conjunction with said housing a covering for a receptacle wherein said housing effecting coverage for approximately half of the top area of a receptacle, and said cover members effect coverage for the remaining area; said cover members also having top walls; the top walls having sloped cam surfaces merging downwardly into respective side walls and said side walls when engaged forming a crevice for receiving the thrust of a downwardly moving object to effect a sidewise camming force on said cover members by virtue of said cam surfaces to swing said cover members away from each other and into said housing to effect an opening into a receptacle.

7. A receptacle cover device comprising:
   a housing having a wall with an opening; pivotal cover means movable in a substantially horizontal plane into and out of said opening; and pintle means for wholly supporting said pivotal cover means and effecting axis means slightly inclined to the vertical to effect a gravitational return motion of said cover means upon release of said external force.

8. A receptacle cover device as set forth in claim 7, said pivotal cover means comprising:
   cover members of quadrant shape and each having a circular wall and a flat wall and a sloping cam wall oriented so as to be the top wall of the respective cover member when said cover members are carried by said pintle means; said flat walls being oriented to be engaged against each other when said cover members are biased out of said housing; wherein each of said cover members is independently biased toward the other; said circular walls being then oriented to effect a generally semicylindrical configuration; and said housing having a generally semicylindrical configuration whereby said housing and cover members effect a generally cylindrical cover device for a receptacle.

9. A receptacle cover device as set forth in claim 7, said housing having a depending bracket adjacent the opening
thereof and said bracket having trunnion sockets comprising said pintle means;
said pintle means further comprising trunnion sockets carried by a top wall of said housing and said latter trunnion sockets being formed in a plate secured within an aperture of said top wall;
whereby a pair of upper trunnion sockets and a pair of lower trunnion sockets are thus effected and wherein a trunnion socket of each pair is axially aligned with a trunnion socket of the other pair to effect said pivotal axis means.

10. A receptacle cover device as set forth in claim 7, wherein said axis means has an inclination up to 10°.

11. A receptacle cover device comprising pivotal cover means movable in a substantially horizontal plane; said pivotal cover means having pintle means disposed to pivotally support said cover means in position to be swung by an external force; said pintle means having a pivotal axis slightly inclined to the vertical to thereby effect a gravitational return motion of said cover means upon release of said external force.

12. A receptacle cover device as set forth in claim 11, said cover means comprising a cover member having a sloped upper camlike surface inclined in a direction to effect a force component for rotating said cover member in a direction opposite to the direction of gravitational return motion when a downward force is exerted on said surface.