Aug. 9, 1960 H. JORDAN 2,948,482

SPLASH GUARD WITH PLUG FOR WASTE DISPOSAL APPARATUS

Filed Nov. 25, 1957 2 Sheets-Sheet 1

FIG. 1.

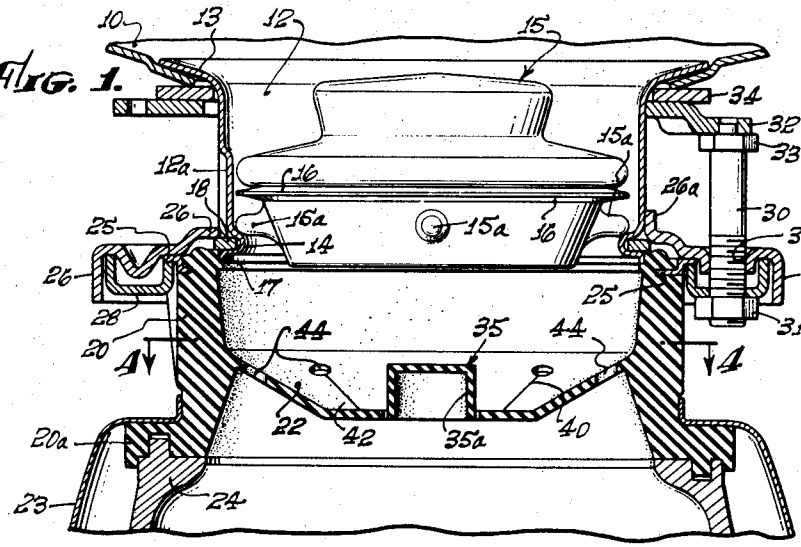


FIG. 3.

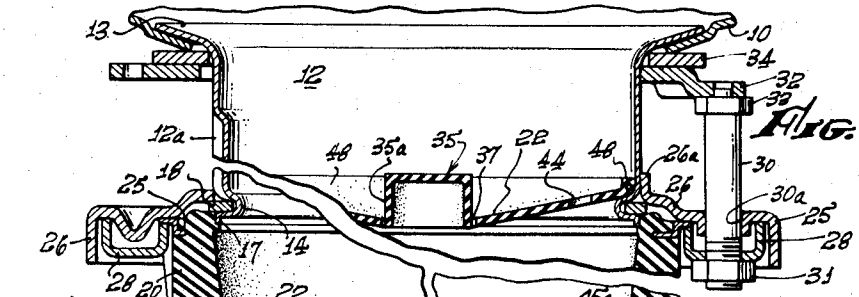


FIG. 2.

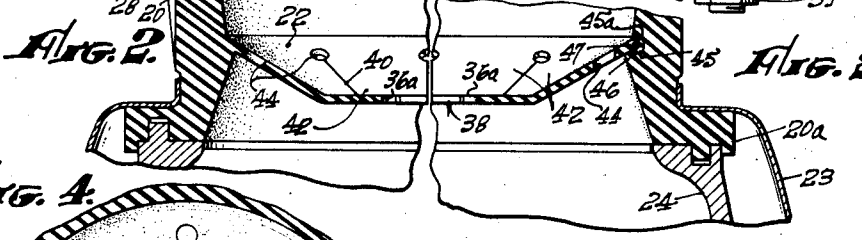


FIG. 2A.

FIG. 4.

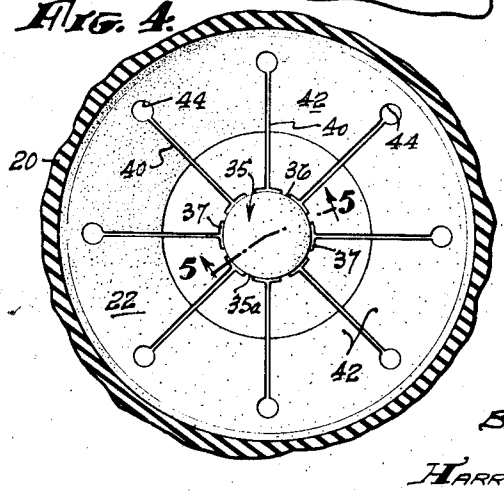
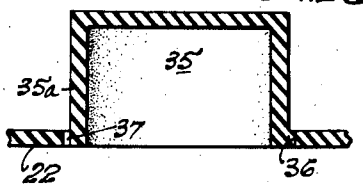


FIG. 5.



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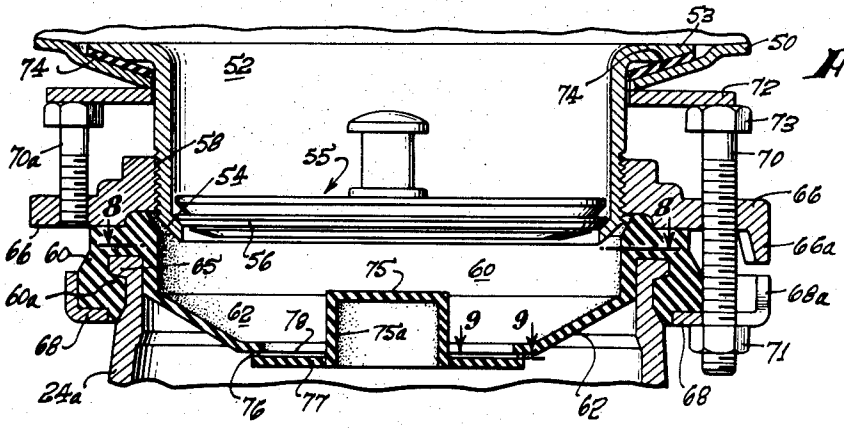


Fig. 6.

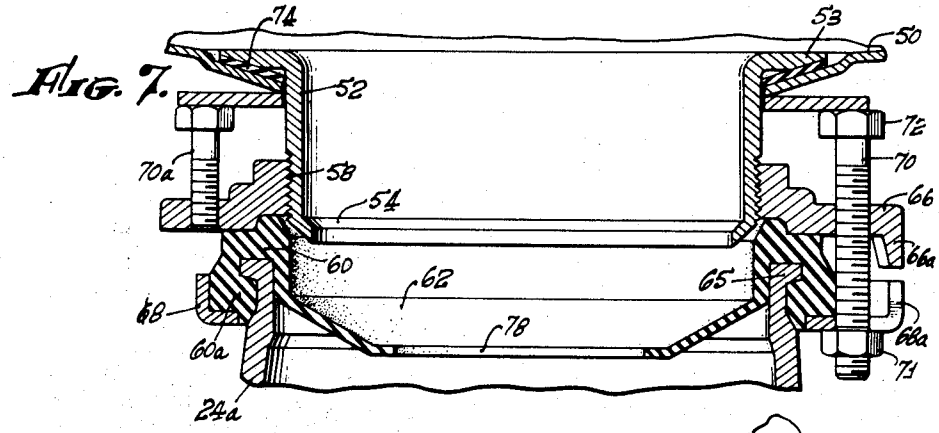


Fig. 7.

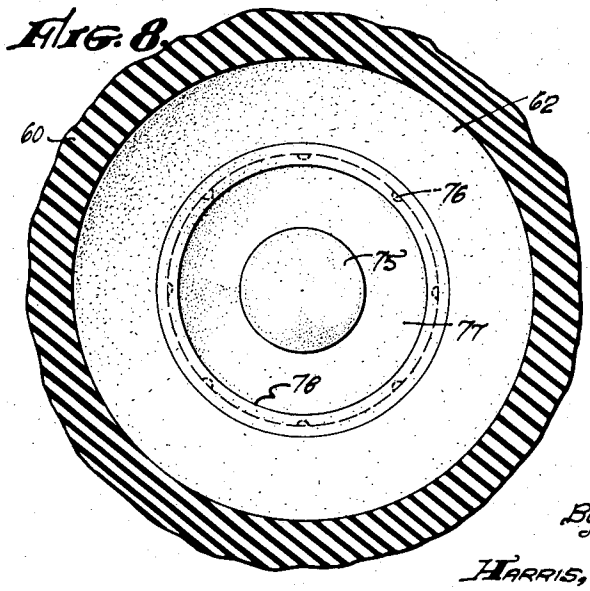


Fig. 8.

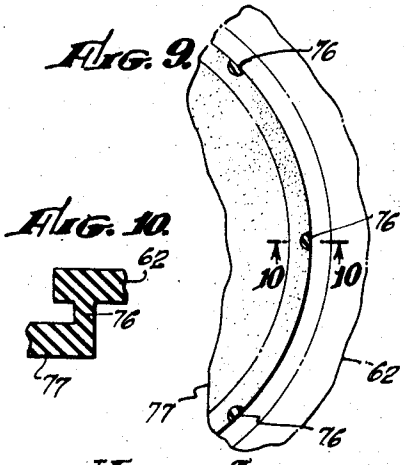


Fig. 9.

Fig. 10.

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SPLASH GUARD WITH PLUG FOR WASTE DISPOSAL APPARATUS

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Filed Nov. 25, 1957, Ser. No. 698,566

5 Claims. (Cl. 241—100.5)

This invention relates generally to the waste disposal art with particular reference to apparatus now commonly employed at the discharge outlets of kitchen sinks and the like to receive culinary waste which is introduced into the apparatus by the human hand or washed into it from the sink, the waste being ground by a motor driven rotary grinder and flushed from the apparatus to a sewer system with water supplied from the sink.

More particularly this improvement relates to a splash guard or antisplash diaphragm disposed at the top of a waste grinder and below the sink outlet which will pass waste from the sink into the grinder, together with flush water, such guard or diaphragm being yieldable to pass the waste and positioned to intercept splash of water and materials undergoing grinding, as well as being capable of intercepting much of the grinding noise.

This invention is an improvement on those shown in my prior Patents Nos. 2,670,143 and 2,785,864.

A principal object of this improvement is to protect the grinding device of such disposal apparatus from entrance of foreign materials, which might be damaging, during construction of buildings following installation of the disposal apparatus and prior to completion for occupancy.

Garbage disposers are now very commonly installed in new homes as original equipment, and are therefore placed in operative position along with plumbing installations. Subsequent workmen, such as plasterers and carpenters, commonly allow materials to drop into kitchen sinks, which materials frequently pass down through the large sink outlets into the grinder housings. Such materials may include nails and other hardware pieces, and other waste which can damage a grinder or result in burning out the motor, or the like, at some future time when the apparatus is to be used.

It is therefore another object of this invention to produce a splash guard of the indicated character which includes a safety element that will prevent the passage of builders' waste materials, or materials unintentionally dropped into a sink under which the disposal apparatus is suspended, down into the grinding chamber of such apparatus.

Since antisplash diaphragms of the indicated nature are commonly produced from rubber or flexible rubber substitutes, one form of this invention includes the provision of an excluding element mounted on such a diaphragm through relatively weak and rupturable attachment means, so that such excluding element will prevent the dropping of small articles or waste builders' materials into a disposal apparatus during building operations. Such an element is easily removed preparatory to placing the disposer in normal operation. In a convenient form, a sort of integral knob or finger grip may be provided at the center of the splash guard, very small integral rupturable connections permitting tearing away of the knob to expose a small water passage and free diaphragm segments which are normally yieldable for the passage of culinary waste.

Other objects of the invention and various usable features of construction will become apparent to those skilled in this art upon reference to the accompanying drawings and the following specification wherein certain embodiments are disclosed.

In the drawings:

Fig. 1 is a vertical section, through the upper end of a garbage grinder shown in suspended position at the under side of a kitchen sink, a form of the improvement of this invention in its original condition being illustrated;

Fig. 2 is a fragmentary view similar to a corresponding portion of Fig. 1, the excluding element or knob shown on the diaphragm in Fig. 1 being, however, removed to prepare the diaphragm for normal grinding use;

Fig. 2A is a fragmentary view similar to that of Fig. 2 but illustrating means for removably mounting the diaphragm in the inner wall of the resilient grinder suspending ring;

Fig. 3 is a somewhat similar view but showing the diaphragm removably mounted upon an internal annular bead of the drainage sleeve supporting the grinder and in position above the resilient grinder suspending ring illustrated, Figs. 2, 2A and 3 collectively representing a sort of composite mounting of the three different structures;

Fig. 4 is a view partly in cross section and partly in plan taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged sectional detail taken on the line 5—5 of Fig. 4;

Fig. 6 is a view similar to that of Fig. 1 showing a modified arrangement of the present improvement;

Fig. 7 is a view like that of Fig. 6 with the stopper of Fig. 6 removed and the protective element on the diaphragm also removed;

Fig. 8 is a view taken on the line 8—8 of Fig. 6;

Fig. 9 is a fragmentary view taken approximately on the line 9—9 of Fig. 6; and

Fig. 10 is a fragmentary vertical sectional detail taken on the line 10—10 of Fig. 9.

The drawings disclose possible embodiments of this improvement, one of which is illustrated in Figs. 1, 2, 4 and 5. Here, a typical kitchen sink **10** provided with the usual drainage opening receives a drainage sleeve **12** which is supported upon the sink by means of an upper annular flange **13**. The lower end of the drainage sleeve **12** is provided with an inwardly directed annular bead **14** which serves internally to support a circular stopper **15** which may have an annular sealing lip **16** to rest upon the bead **14** to cut off water flow, and may also have a series of spaced yieldable lugs **15***a* which may rest upon the top of the bead **14** as shown to provide for the flow of water between the stopper **15** and sleeve **12** but would yield under downward pressure to snap past the bead **14** and permit seating of the annular sealing lip **16**. The sleeve **12** may also have a circumferential series of three or four upstanding inwardly struck spacer detents **12***a* to center the stopper **15** when elevated as shown, whereby to insure good water flow. The bottom wall **17** of the bead **14** is relatively flat to provide a base or support for a snap ring **18** for supporting the weight of a garbage grinder or the like from the sleeve **12**.

To accomplish this support, in this form of the invention, an annular rubber suspension neck **20** is employed between the sleeve **12** and the mentioned garbage grinder, this neck **20** having integrally formed with an intermediate portion thereof a rubber splash diaphragm **22**. A garbage grinder housing **24** to be suspended is secured to the lower end **20***a* of the rubber neck **20** as by vulcanization of such lower end **20***a* to the top of the housing **24**. An auxiliary outer housing **23** which might be of a snap ring construction may also assist in retaining in operative relationship the housing **24** and said lower neck end **20***a*.

To support the rubber neck **20** from the suspending snap ring **18** an annular support ring **25** is embedded and vulcanized in the upper end of the annular rubber neck **20**. This ring **25** is overlain by a flanged mounting ring **26** whose inner edge bears upon the outer edge of the snap ring **18**. To provide for proper centering of the mounting ring **26** on the snap ring **18**, the mounting ring may be provided with an annular series of spaced upstanding positioning fingers **26***a* which bear against the outer wall of the sleeve **12**. To retain the annular rubber neck **20** and its support ring **25** in supported position with respect to the mounting ring **26**, a double flanged or channeled ring **28** is mounted within the downturned flange of the mounting ring **26** so that the inner flange of this clamp ring **28** bears under the extending portion of the support ring **25** and holds the latter and the neck **20** in suspended position as shown. To retain this position of the parts, a plurality of suspension bolts **30** is used, these being threaded at **30***a* into vertically aligned hub portions of the mounting ring **26** with their lower ends extending through the channeled clamp ring **28** and receiving nuts **31** to maintain the relationship. At their upper ends, reduced portions of the bolts **30** enter small holes in a tensioning ring **32** around the sleeve **12**, and nuts or heads **33** carried on upper portions of the bolts **30** place the ring **32** under tension to compress an appropriate washer **34** lying between the ring **32** and the adjacent under portion of the sink **10**.

Thus, Figs. 1 and 2 disclose one desirable means for positioning a rubber diaphragm **22** of this invention. To accomplish the exact purpose of the present improvement, the yieldable diaphragm **22**, which is produced from the indicated rubber or some equivalent yieldable resilient, preferably plastic, material, is provided with a central integral removable closure such as the indicated upstanding closure cap or knob **35** of Fig. 1. This closure cap **35** is largely severed from the adjacent annular portion of the diaphragm **22**, being positioned by small integral joint elements **36** best indicated in Figs. 4 and 5 disposed between narrow spacing slits **37** lying between the joint elements **36**. These joint elements are small enough to be readily rupturable by pulling the closure cap **35** out of its position at the center of the diaphragm **22**, since they occupy only a small proportion of the area around the base **35***a* of the cap **35**, while at the same time being strong enough initially to retain the cap **35** securely mounted upon the central portion of the diaphragm **22** in protecting position.

Thus, when a garbage grinder **24**, equipped with a diaphragm **22** of the present invention is installed in a building under construction, plaster droppings, nails, wood shavings and other pieces of wood are caught by the diaphragm and the closure cap **35** and are prevented from falling into the grinder space within the grinder housing **24**. This will avoid damage to the grinder upon subsequent operation which might otherwise result by reason of the falling of such dropped waste materials through the diaphragm **22**.

When the building has been completed and readied for occupancy, together with cleaning out of all trash from the diaphragm **22**, the closure cap **35** is now jerked or pulled out of its seat in the center of the diaphragm **22**, thus leaving a circular passage **38** through the diaphragm **22** through which garbage and other waste material, together with the usual flushing water, will pass. In a preferred form of diaphragm the portion spanning the opening or throat to the garbage grinder is segmented as by slits **40** to provide yieldable fingers or segments **42** radiating outward from the central opening **38**. To guard against undue tearing at the ends of the slits **40**, small circular openings **44** are provided. With this construction, sizable pieces of waste materials such as bones may be easily forced down through the diaphragm **22** by reason of the yieldability of the segments **42**, these resilient portions snapping back into the normal position illustrated upon passage of the waste. The opening **38** in the diaphragm **22**, which is now unobstructed except for very small remnants **36***a* of the ruptured joint elements **36**, is small enough so that a normal amount of flushing water flowing from the sink above substantially fills such opening and, in conjunction with the segments **42** of the diaphragm, blocks off all splashing and substantially all grinding noises. Thus, in conjunction with the vibration-absorbing characteristics of the rubber or other resilient neck **20**, very little noise from the grinding elements including a typical electrical motor in the disposer housing **24** is transmitted to the sink and to the room in which it is located.

While Figs. 1 and 2 disclose the diaphragm **22** as being integral with the rubber suspension neck **20**, such diaphragm may, however, be removable in a manner such as indicated in Fig. 2A but being provided with an enlarged integral annular rim portion **45** which is snapped into a corresponding annular groove **45***a* on the inner wall of the suspension neck **20** immediately above an annular shoulder **46**. Preferably the annular rim **45** will have centrally imbedded therein a resilient wire core **47** which provides for positively snapping the rim **45** into position, and at the same time resists undesired dislodgment of the diaphragm **22**. Again, the diaphragm **22** may be removably mounted as illustrated in Fig. 3 where it is provided with an integral upstanding rim **48** that seats within and rests upon the previously described inwardly directed annular bead **14** of the drainage sleeve **12**, and may permanently replace the stopper **15** of Fig. 1.

Another manner of mounting the resilient diaphragm of this invention is illustrated in Figs. 6 to 10. Here, the sink **50** receives at its drainage opening a drainage sleeve **52** flanged at **53** and having on its lower end an inturned annular seat **54** for a stopper **55** having an annular sealing lip **56**. The sleeve **52** is externally threaded at its lower end as indicated at **58** for support of a garbage grinder housing **24***a* mounted in suspended position below the drainage sleeve **52**.

At the top of the grinder housing **24***a* there is located a cushioning ring **60** of rubber or similar elastomeric resilient material as previously indicated by which an anti-splash diaphragm **62** is integrally carried. This diaphragm, like the antisplash diaphragm **22** of Fig. 1, is desirably cup-shaped, being directed downward and inward to discharge waste and wash water toward the center of the grinding chamber within the housing **24***a*. For proper positioning of the annular resilient ring **60** in vibration-absorbing position between the top of the housing **24***a* and the drainage sleeve **52**, the top of such housing is provided with an outwardly directed integral flange **65** around which the annular body portion of the ring **60** is fitted or molded as illustrated. The top of the ring **60** is clamped against the under side of a mounting ring **66** threaded upon the sleeve **52** by means of the previously indicated threads **58**, and a clamp ring **68** is disposed around the top of the grinder housing **24***a* below the flange **65** thereof and below the depending outer flange portion **60***a* of the rubber ring **60**. The clamp ring **68**, which is angle-shaped in cross section to provide an upstanding outermost flange, is provided with an annular series of outwardly extending ears **68***a*, which may be slotted as indicated at the right of Fig. 6 and receive suspension bolts **70**. These bolts **70** are threaded into the mounting ring **66** and receive on their lower ends nuts **71** bearing against the under side of the clamp ring **68** for the purpose of compressing the outer depending flange portion **60***a* of the rubber ring **60** as required to provide tight joints and good vibration-absorbing suspension. It is desirable to limit compression of the ring portion **60** between the clamp ring **68** and the mounting ring **66**, and for this purpose annular portions of the mounting ring above the ears **68***a* of the clamp ring **68** are provided with depending fingers **66***a* aligned with corresponding ear portions **68***a*, so that

the portions **66***a* and **68***a* will be brought into contact to limit indicated compression of the rubber ring **60** should the nuts **71** be tightened sufficiently to accomplish otherwise such result. In this form the head **73** of each bolt **70** is adjusted, before tightening its nut **71**, to bind against a tension ring **72** underlying the sink **50**, whereby to properly compress a washer **74** to yield a fluid-tight joint between the sink adjacent its drainage opening and the overhanging flange **53** of the sleeve **52**. An intermediate spacer bolt **70***a* is threaded into the mounting ring **66** and its head engages the tension ring **72**.

The central portion of the antisplash diaphragm **62** is provided with a temporary closure cap or knob **75** corresponding generally with the temporary closure knob **35** of the form of Fig. 1. With this particular construction, the diaphragm **62** is provided with a large discharge opening **78** and is not necessarily segmented as is the diaphragm **22** of Fig. 1. With this form small spacing joint elements **76**, integral with the diaphragm **62** and a horizontal web portion **77** of the temporary closure **75**, annularly located around the opening **78**, are used at the under side of the diaphragm **62** so as to position the web portion **77** below the level of the diaphragm **62**.

Thus, since the joint elements **76** are of limited extent around the opening **78**, but are nevertheless sufficiently strong to support waste plaster, wood scraps and the like, the temporary closure **75**, **77** is both adapted to protect the grinding mechanism in the grinder housing **24***a* during building operations, and to be manually torn away when the home or other building is finished for occupancy so that the garbage grinder is ready for normal use. In this particular form, the opening **78** in the antisplash diaphragm **62** may be relatively large as indicated so as to pass a human hand if desired, or it could be small and be closed by a temporary closure knob **35** like that of Fig. 1, whereby to yield a small passage like the passage **38**, which would be completely filled with water during flushing operations. Such a small passage may amount to only around one tenth of the cross-sectional area of the throat spanned by the diaphragm.

As will be apparent from the foregoing, an antisplash diaphragm **22** or **62** may be integrally or removably carried by a cushioning ring **60**, or by a free suspension ring or neck **20**, and may have a relatively large discharge passage **78**, or a relatively small-capacity discharge passage **38**. With either form, or kindred form, any of the indicated structures with a temporary closure such as the closure **35** or the closure **75** are readily molded and cured so that the small joint elements **36** and **76**, which are the only connections attaching these temporary closures to the respective antisplash diaphragms, are readily rupturable to clear the spaces **38** and **78** when the buildings are ready for occupancy, and yet are amply strong and durable to prevent undesired materials from falling into the grinding devices during building operations.

It has been indicated above that the resilient suspension neck **20** and the diaphragm **22** and **62** may be produced from natural rubber or from synthetic rubber or other flexible rubber substitutes, all of which are frequently identified by the more recent term "elastomers" and which we sometimes designate herein as elastomeric materials.

The invention claimed is:

1. In combination in waste disposal apparatus: a sink having a drain opening; a grinder housing suspended under said opening and having a waste receiving throat; a resilient ring device disposed between said sink and said housing and cushioning the latter to limit transmission of vibrations to said sink; and an antisplash diaphragm carried by said resilient device, said diaphragm having a circular body portion and a temporary closure attached thereto centrally to close a discharge passage therethrough, said diaphragm having readily rupturable joint means connecting said temporary closure to said body portion to retain waste materials thereon, and being rupturable for removal of said closure to open said discharge passage.

2. A combination as in claim 1 wherein said diaphragm, closure and joint means are elastomeric material.

3. An antisplash diaphragm for a water-flushed waste disposal apparatus, including a circular disk member, such member being partially severed around a central area thereof to form a rupturable joint with a central closure member in said area, said joint being manually rupturable to release said closure member from said disk member to leave a central opening in said disk member, said disk member being provided with radial slits extending outwardly from said rupturable joint and circumferentially spaced around said disk member.

4. A diaphragm as set forth in claim 3, in which said central closure member has a portion extending upwardly from said rupturable joint and adapted to be grasped manually to release said closure member from said disk member along said joint.

5. An antisplash diaphragm for water-flushed disposal apparatus including a circular disk member formed of elastomeric material capable of returning to its original shape on release of expanding pressures, such member being partially severed adjacent its center to provide a temporary central closure member joined to a surrounding annular body portion of said disk member by plural spaced rupturable joint elements easily ruptured by manual pull upon said closure member to leave a central passage therethrough, the portion of said disk member surrounding said passage being segmented to yield to waste material forced therethrough.

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