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(54) **CARTRIDGE ACCOMMODATING CASE**

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(57) **ABSTRACT**

A cartridge accommodating case for accommodating flat body-shaped cartridges in each of which a reel with a magnetic tape wound therearound is disposed, including: an upper case; and a lower case, the upper case and the lower case being adapted to be superposed on each other to form at least one partitioned chamber for holding a cartridge group formed into a block by juxtaposing a plurality of cartridges in a thicknesswise direction thereof, wherein a tab is extendedly provided on a peripheral edge of each of the upper case and the lower case.

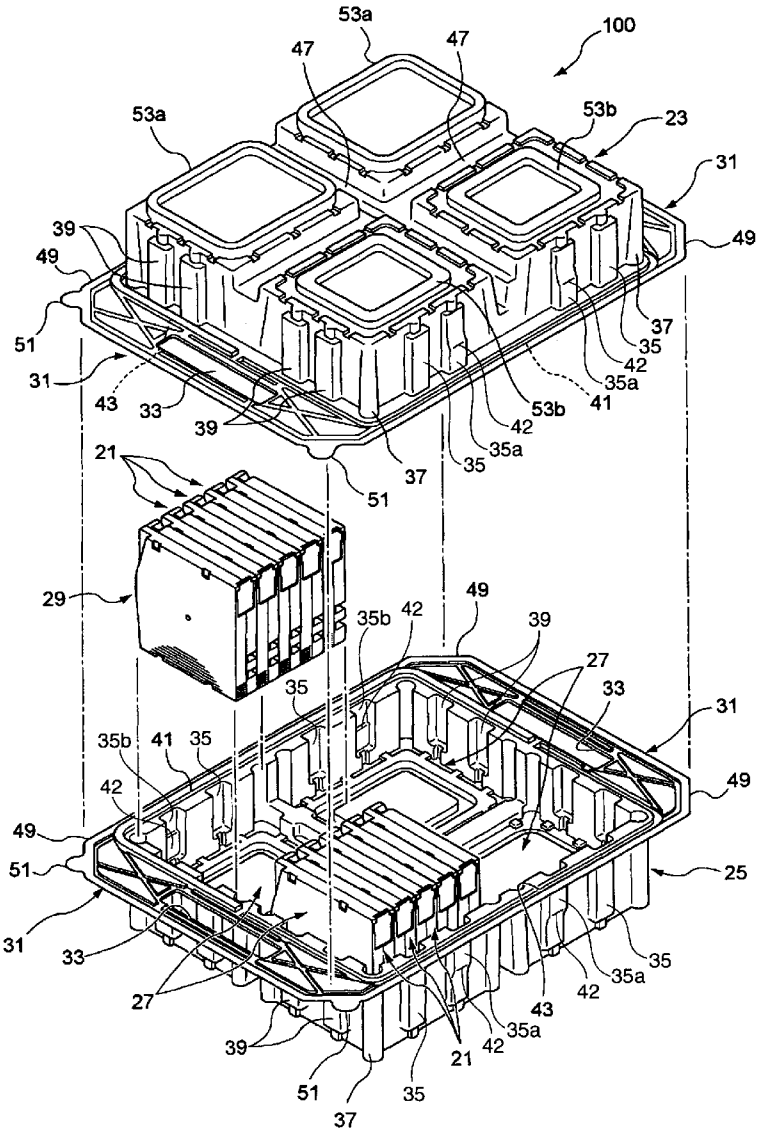


FIG. 1

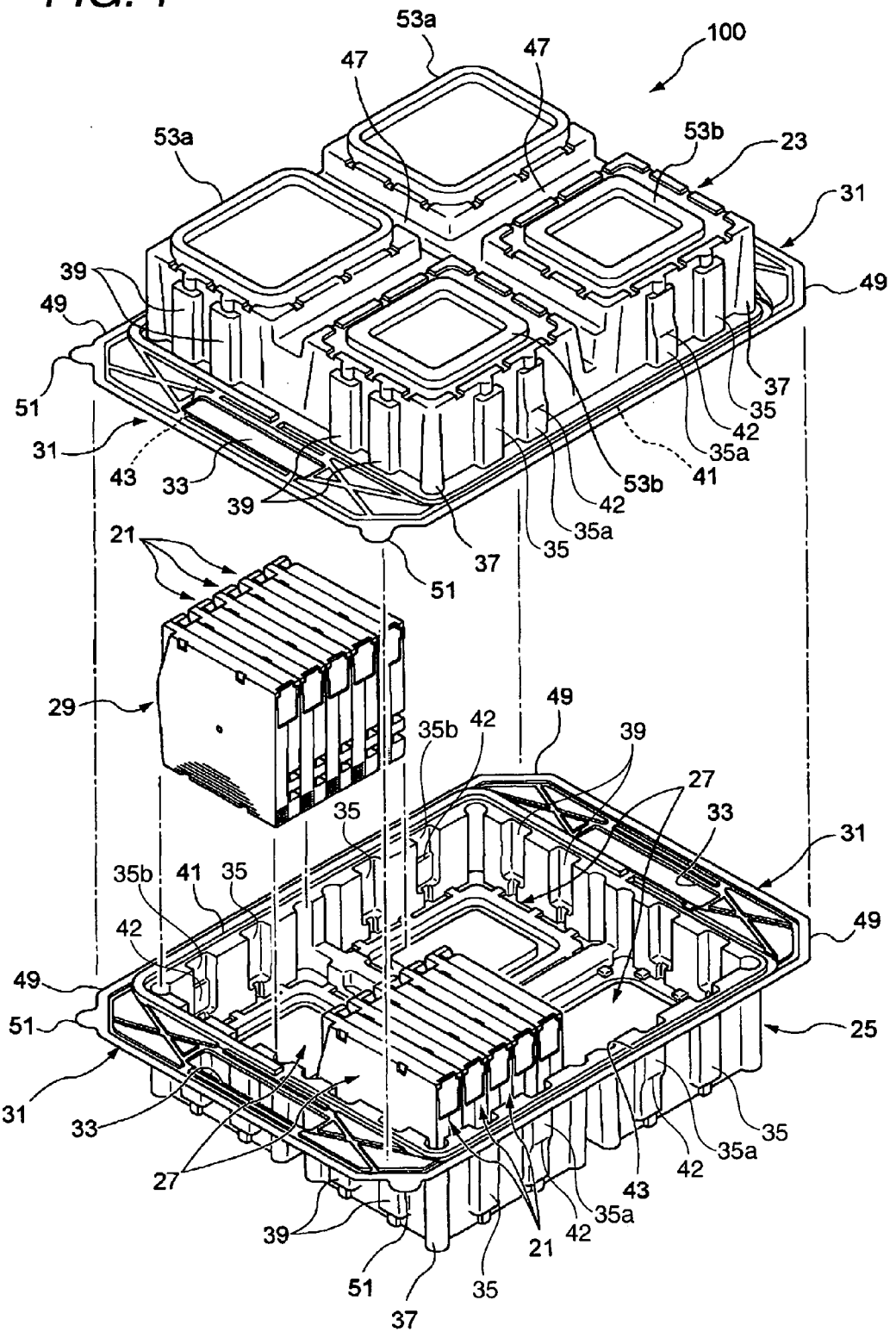

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FIG. 2A

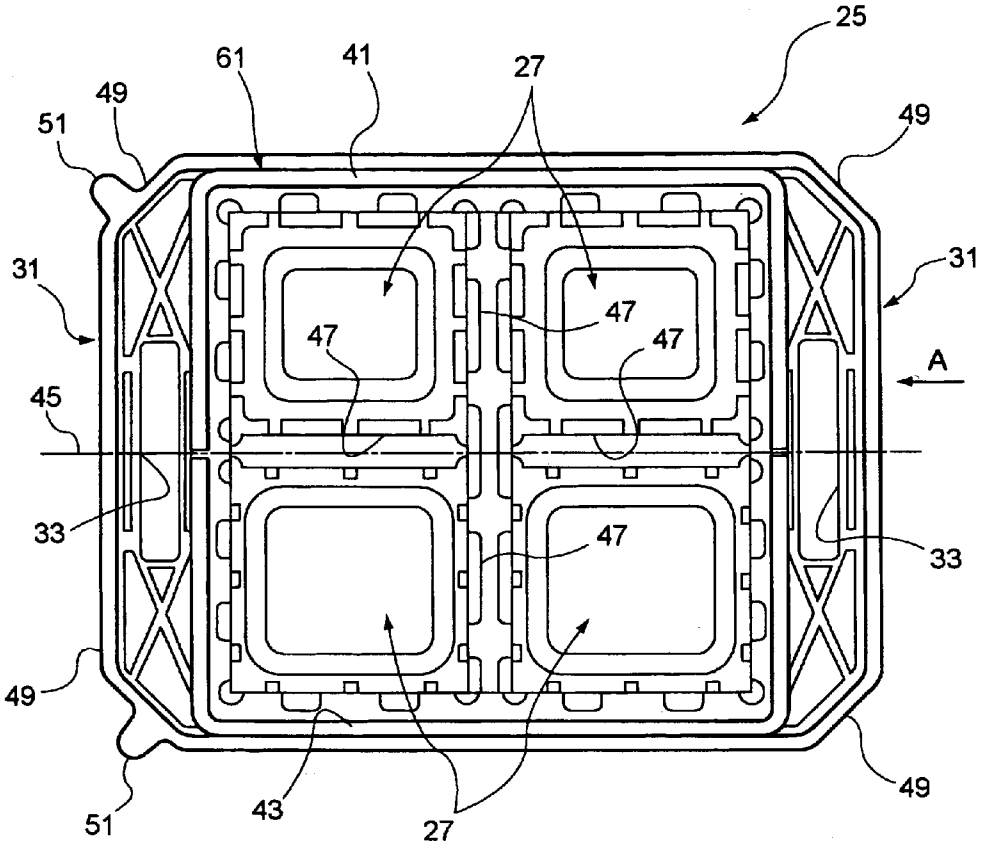

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FIG. 2B

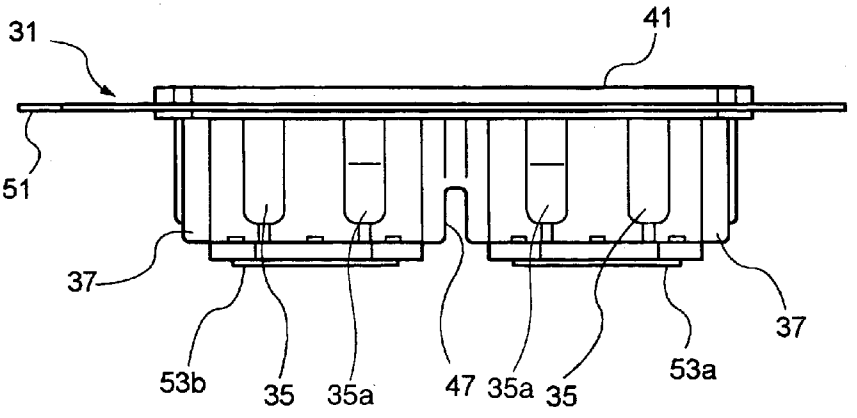

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FIG. 3

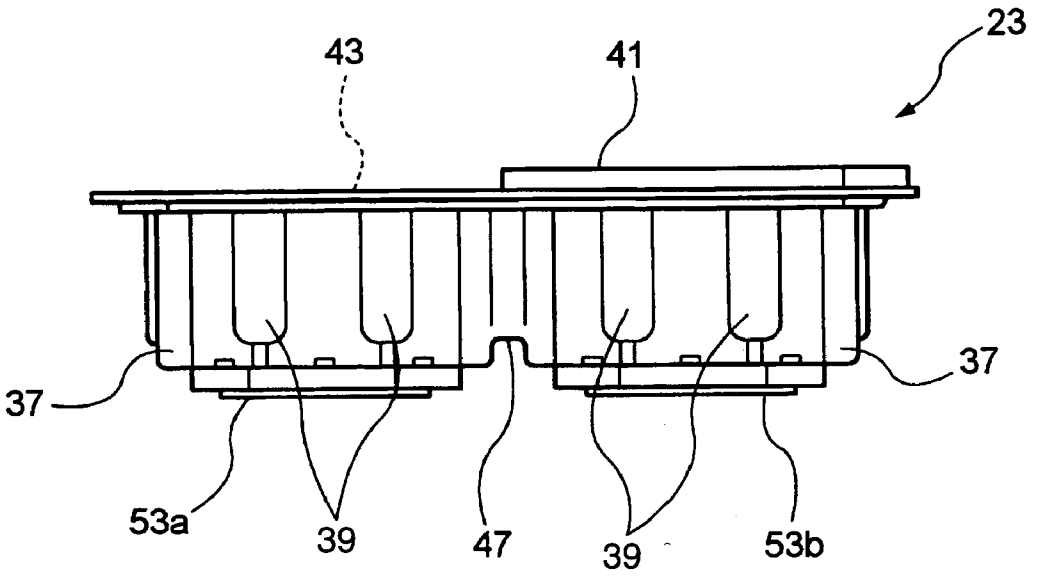


FIG. 4

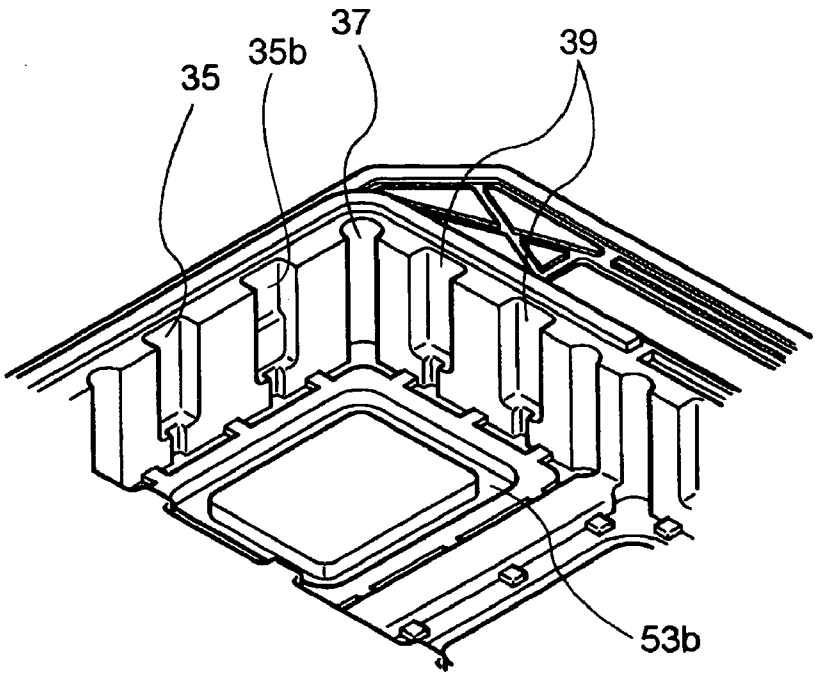


FIG. 5

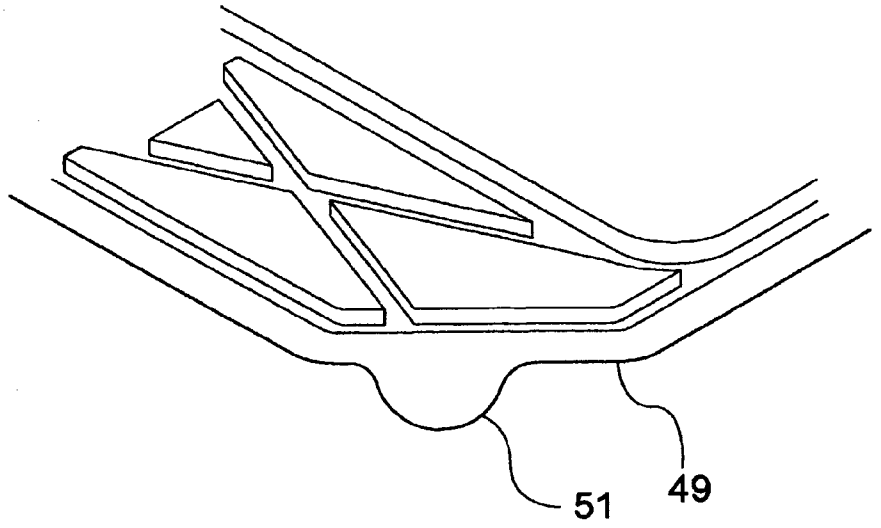


FIG. 6

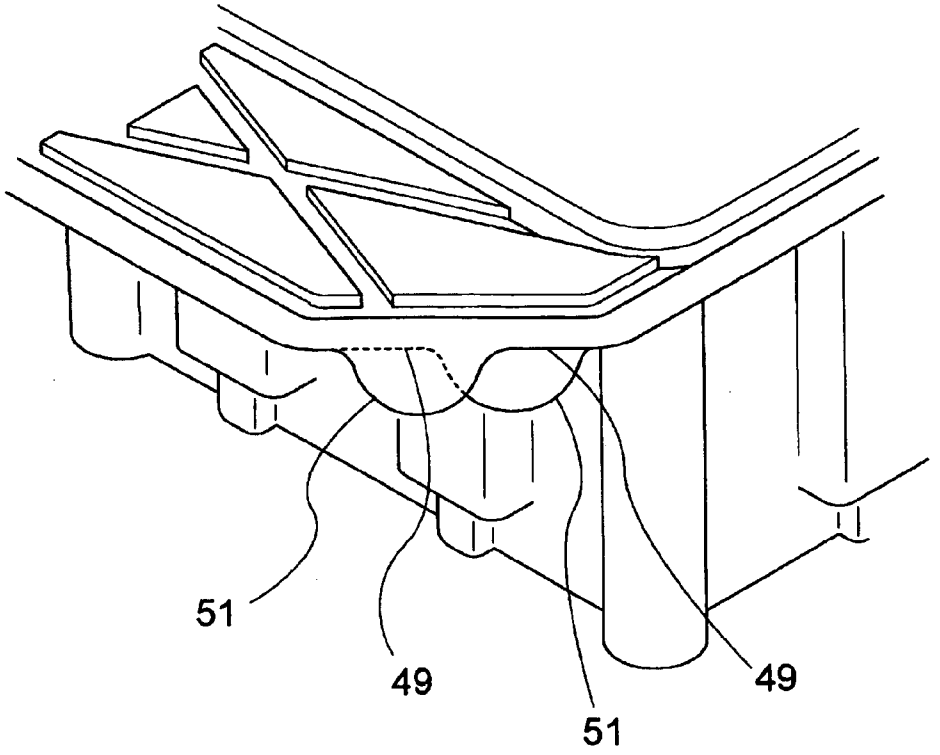


FIG. 7

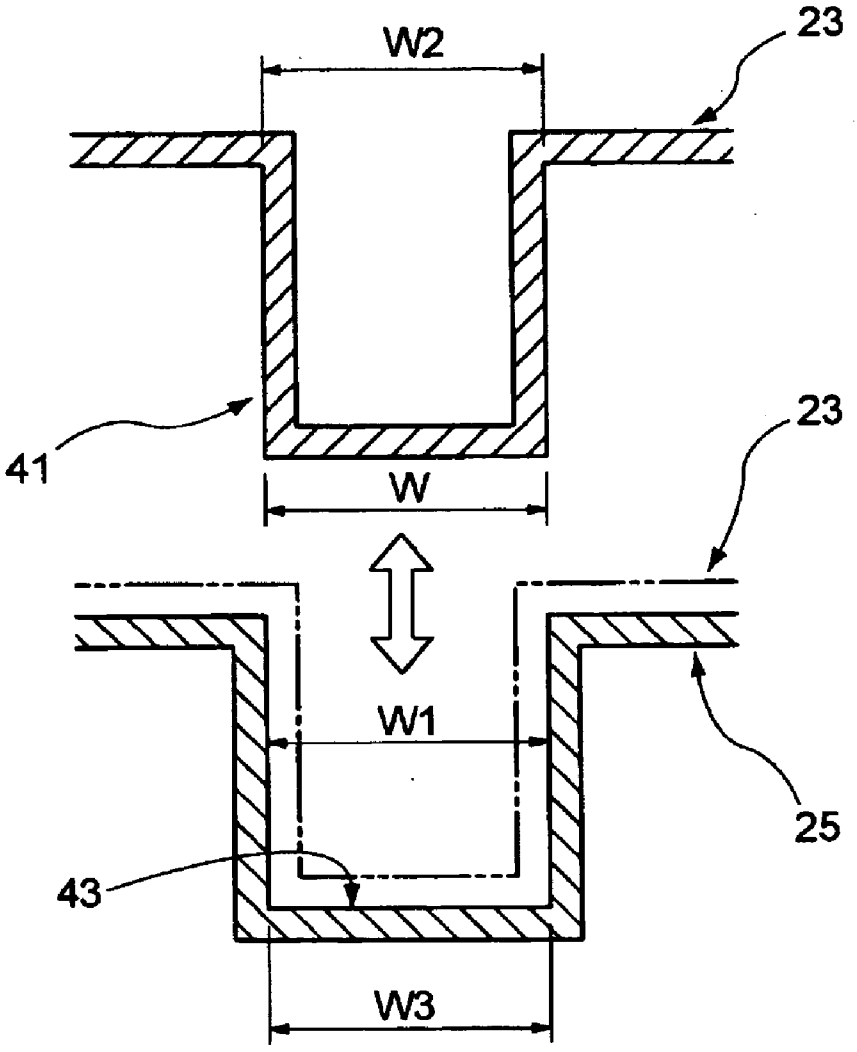


FIG. 8

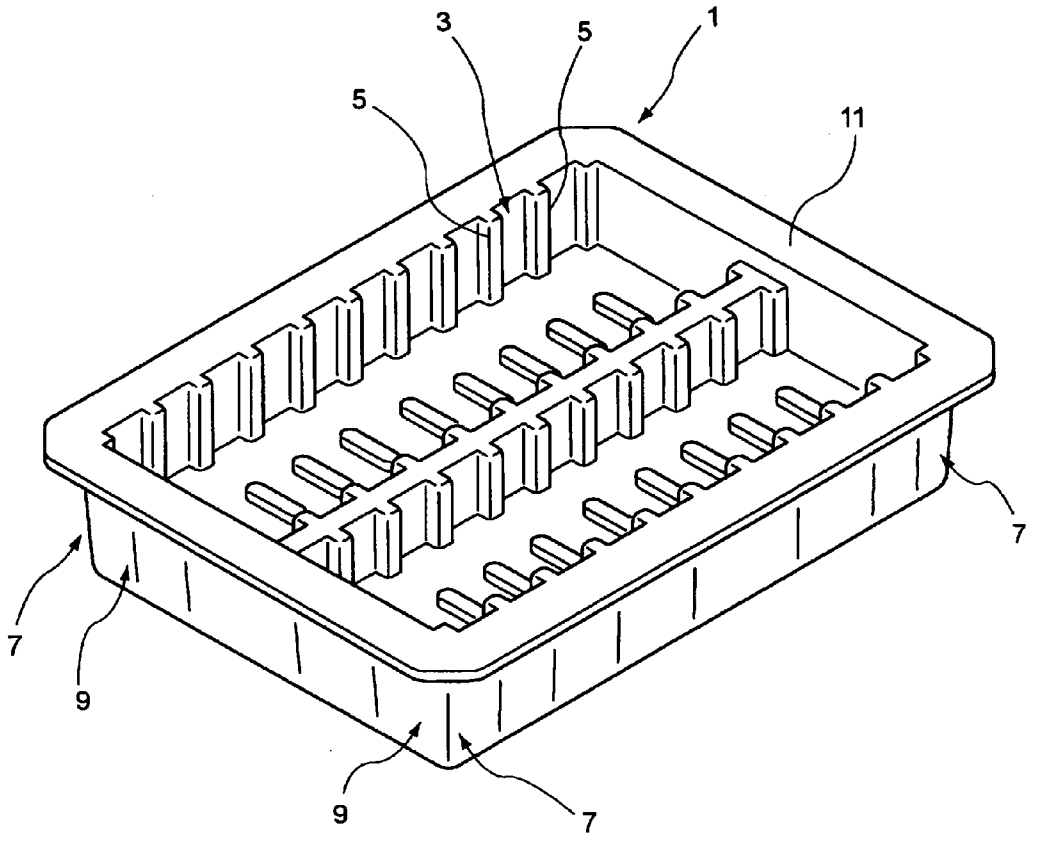


FIG. 9

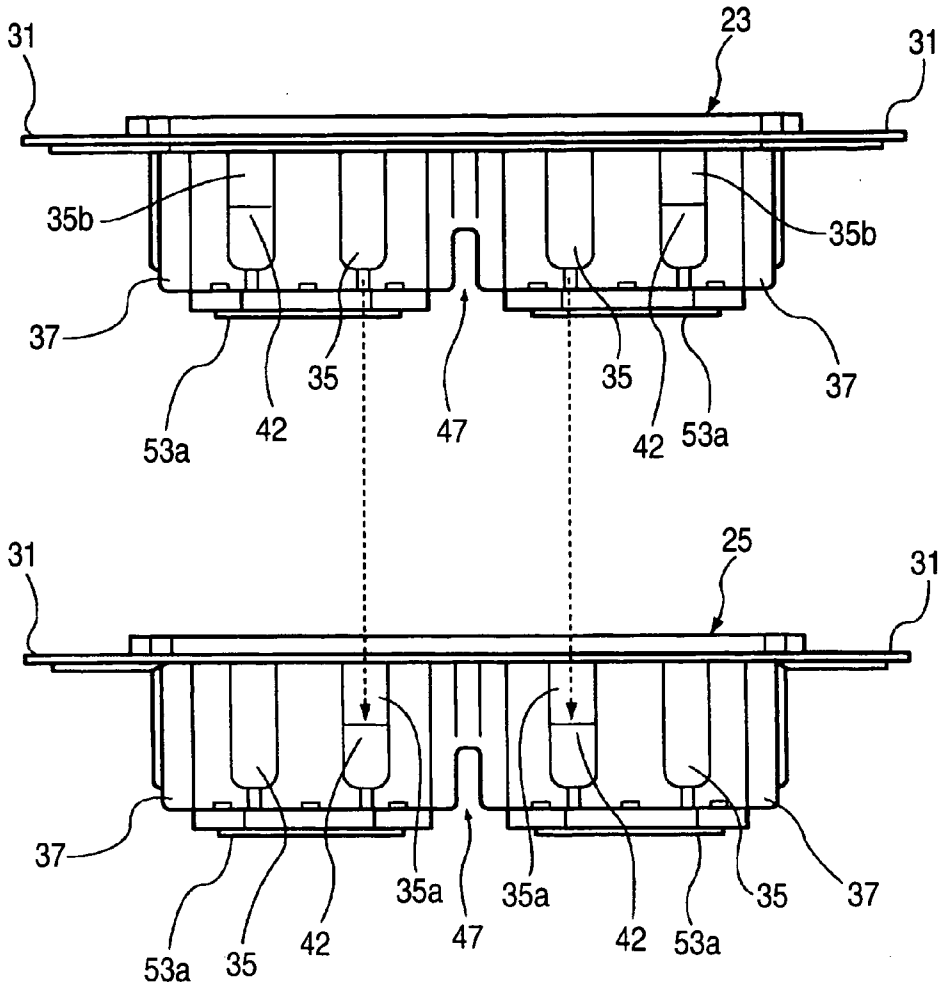

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FIG. 10

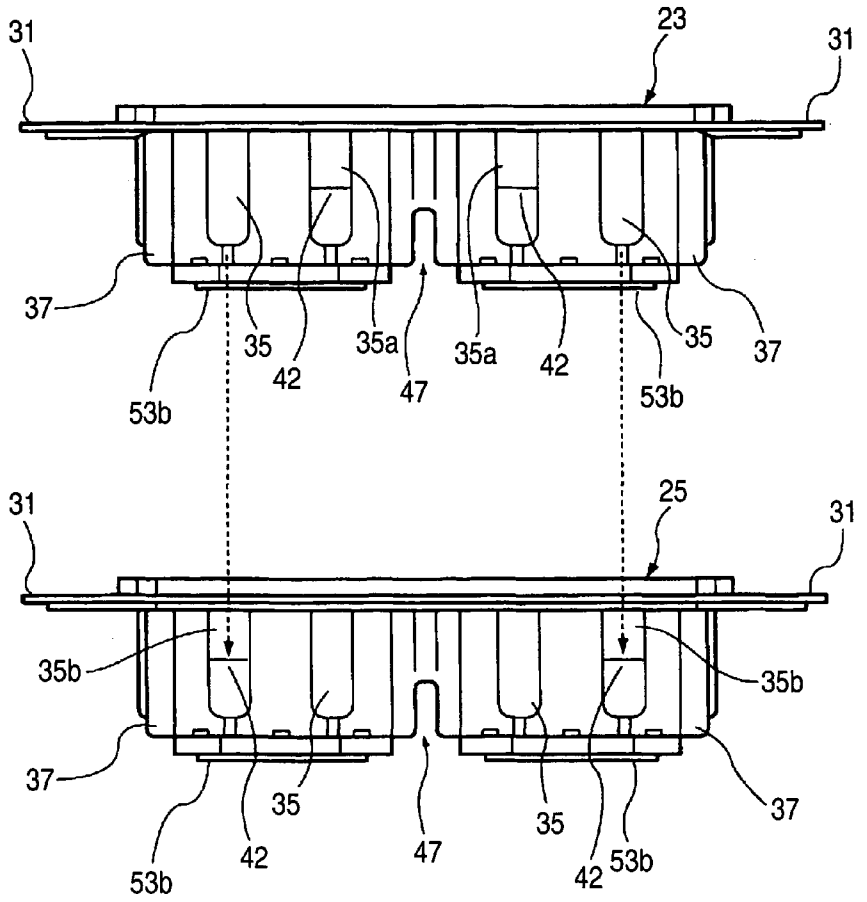

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FIG. 11

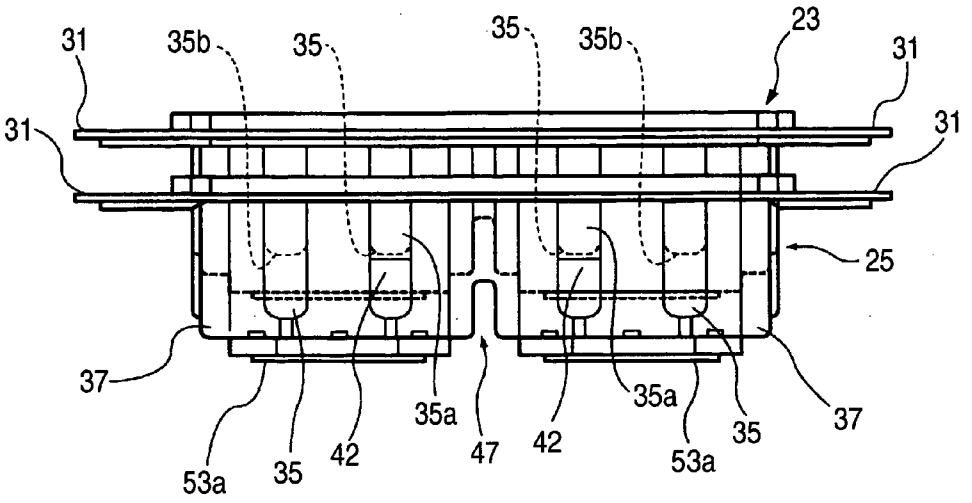
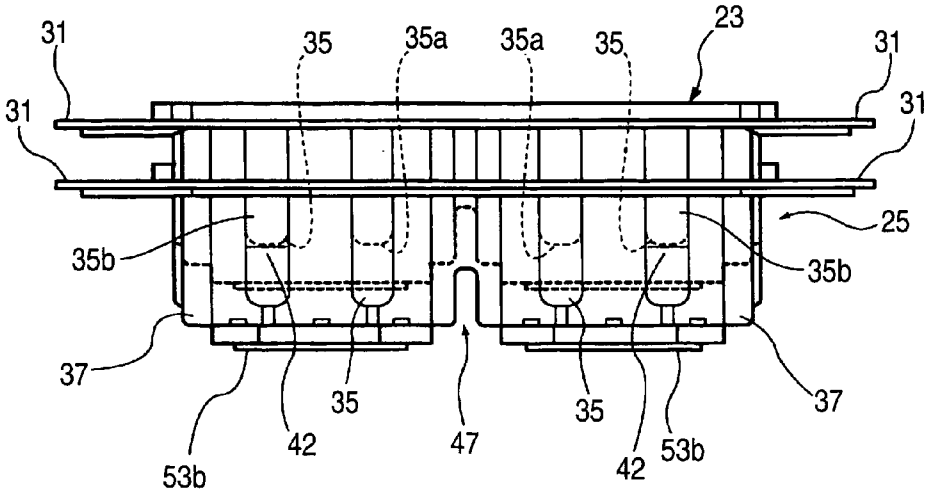

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FIG. 12


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CARTRIDGE ACCOMMODATING CASE

FIELD OF THE INVENTION

[0001] The present invention relates to a cartridge accommodating case for accommodating flat body-shaped cartridges in each of which a reel with a magnetic tape wound therearound is disposed.

BACKGROUND OF THE INVENTION

[0002] Conventionally, in cases where magnetic recording tape cartridges of a one-reel type are collectively packaged, the cartridges are accommodated in cases in cartridge units, and a plurality of such cases are packaged in a corrugated cardboard box to retain cushioning characteristics.

[0003] However, in the case of this collective packaging, since the cartridges are accommodated in the corrugated cardboard box, it is necessary to open the corrugated cardboard box in order to confirm the presence or absence, types, and the like of the cartridges, so that there has been a problem in terms of convenience. In addition, there has been a problem in that if the corrugated cardboard is used in the packaging, the corrugated cardboard becomes wet when immersed in water, and the corrugated cardboard box becomes broken.

[0004] Under these circumstances, a case in which cartridges are collectively packaged in a transparent plastic which does not cause a hindrance to the strength of the case even if it is wet with water and which allows the contents to be visible, is disclosed in a non-patent document (LTO-Ultrium L-pack, [online], TDK Corporation, Internet <URL: http://www.tdk.com/professional/lto/ltolpack.html>), and has become available on the market, as shown in FIG. **8**.

SUMMARY OF THE INVENTION

[0005] However, in a case **1** disclosed in the aforementioned non-patent document, the interior of the case **1** is partitioned into a plurality of accommodating spaces **3** for accommodating individual cartridges by a plurality of partition projections **5**, and the cartridges are respectively stored in these accommodating spaces **3** in cartridge units. In other words, the cartridges are dispersedly accommodated. For this reason, the cartridges are accommodated one by one in the actual accommodating operation, so that there has been a problem in that the ease of use becomes poor particularly in the case where there is a large quantity of cartridges. In addition, in the above-described case **1**, since the interior of the case **1** is partitioned into the individual accommodating spaces **3**, the entire accommodating area (i.e., the opening area of the upper plane of the case **1**) is equally divided by the individual accommodating spaces **3**. For this reason, when the case **1** is dropped with far end portions **7** and **9** of lateral sides of the case **1** facing downward, the load of substantially the total number of accommodated cartridges is concentrated at these far end portions **7** and **9**. Hence, there has been a problem in that the impact resistance is insufficient, and the impact absorbing capability when the case **1** is dropped is low.

[0006] In addition, in the above-described case **1**, a flange **11** is formed around the periphery of the opening of the case **1**, and a plurality of fitting means constituted by unillustrated protruding portions and recessed portions for fitting to counterparts of another case **1** are formed on this flange **11** symmetrically about a case center. Further, as two cases **1** with their flanges **11** opposed to each other are superposed on each other vertically, these fitting means are engaged to form the accommodating spaces **3** for the cartridges.

[0007] However, if the upper case **1** and the lower case **1** are of the same shape, their opposing flanges **11** are superposed on each other with identical outer shapes over their entire peripheries, so that particularly in a case where the fitting of the fitting means is firm, the opening of the upper case **1** with respect to the lower case **1** is difficult.

[0008] The present invention has been devised in view of the above-described circumstances, and its first object is to obtain a cartridge accommodating case which has high efficiency in the accommodating operation while retaining the impact resistance. A second object of the invention is to obtain a cartridge accommodating case which makes it possible to easily open the superposed assembly of the cases which have been integrated by causing the protruding portions and recessed portions to each other.

[0009] The above objects of the invention can be attained by the following configurations.

[0010] (1) A cartridge accommodating case for accommodating flat body-shaped cartridges in each of which a reel with a magnetic tape wound therearound is disposed, comprising: an upper case; and a lower case, the upper case and the lower case being adapted to be superposed on each other to form at least one partitioned chamber for holding a cartridge group formed into a block by juxtaposing a plurality of cartridges in a thicknesswise direction thereof, wherein a tab is extendedly provided on a peripheral edge of each of the upper case and the lower case.

[0011] According to this cartridge accommodating case, with respect to the upper case and the lower case integrated by mutually engaging the protruding portions and the recessed portions, it is easily possible to cause opening forces to act by holding the tabs provided at the peripheral edges of the respective cases and moving them in mutually opposite directions. In other words, the cases can be reliably engaged with each other with such a large engaging force that the disengagement would be difficult if the tabs **51** were not provided.

[0012] (2) The cartridge accommodating case according to (1) above, wherein each of the upper case and the lower case is formed by a quadrangular outer shape having four corner portions at its periphery, and a bevel portion is formed at at least one corner portion of each of the upper case and the lower case by removing this corner portion along an inclined side, the tab being formed on the bevel portion.

[0013] According to this cartridge accommodating case, since the tab is extendedly provided on the bevel portion formed at at least one corner portion of the quadrangular outer shape, the tab can be disposed at a position where it is easy to hold.

[0014] (3) The cartridge accommodating case according to (2) above, wherein the tab extendedly provided on the bevel portion is formed on an inner side of a quadrangular region enveloping four outer sides of the case.

[0015] According to this cartridge accommodating case, the tab does not project from the aforementioned quadrangular region, so that even if the accommodating case is accommodated in a corrugated cardboard box having the same inner shape as the outer shape of the case, the tab does not hinder the accommodation.

[0016] (4) The cartridge accommodating case according to (2) or (3) above, wherein the bevel portion is formed at at

least two adjacent ones of the corner portions, and the tabs extendedly provided respectively at the two corner portions are each disposed in such a manner as to be offset from a center of the inclined side of the bevel portion.

[0017] According to this cartridge accommodating case, the tabs are respectively disposed on the bevel portions, which are provided at the two adjacent ones of the corner portions of the case, in such a manner as to be offset from the center of the inclined side. Therefore, if identical cases molded by the same mold as the upper case and the lower case are superposed on each other vertically, the upper and lower tabs are disposed in such a manner as to be offset from each other along the inclined side at the vertically superposed two corner portions. Hence, it becomes possible to easily perform the opening operation in which the tab of the lower case is pulled downward, and the tab of the upper case is pulled upward.

[0018] (5) The cartridge accommodating case according to any one of (1) to (4) above, wherein each of the upper case and the lower case is constituted by an integrally molded piece of a plastic resin.

[0019] According to this cartridge accommodating case, a high-precision upper case and lower case can be mass produced easily at low cost by using a material which is relatively easily available.

[0020] (6) The cartridge accommodating case according to (5) above, wherein the plastic resin includes any one of polyethylene terephthalate, polypropylene, and polystyrene.

[0021] According to this cartridge accommodating case, as the plastic resin is any one of polyethylene terephthalate, polypropylene, and polystyrene, the material is easily available, and easy and low-cost vacuum molding is possible.

[0022] (7) The cartridge accommodating case according to (5) or (6), wherein the plastic resin is translucent.

[0023] According to this cartridge accommodating case, when the upper case and the lower case are engaged with each other, and the partitioned chambers are set in a hermetically sealed state, the cartridges accommodated in the partitioned chambers are visible from the outside, so that the state of accommodation of the cartridges in the hermetically sealed partitioned chambers can be easily grasped.

[0024] (8) The cartridge accommodating case according to any one of (5) to (7) above, wherein each of the upper case and the lower case is formed by using a plastic resin sheet having a thickness of 0.5 to 2.0 mm and subjecting it to drawing.

[0025] According to this cartridge accommodating case, as each of the upper case and the lower case is formed by using a plastic resin sheet having a thickness of 0.5 to 2.0 mm and subjecting it to drawing, the minimum structural strength of the partitioned chambers for accommodating the plurality of cartridge groups can be economically ensured. Further, the overall weight of the case can be set to a minimum while satisfying the minimum strength. In addition, as the case is formed with the aforementioned thickness, appropriate deformation becomes possible when an external force is applied, thereby making it possible to optimally secure the impact absorbing action with respect to the accommodated cartridges. In other words, if the case is thinner than the aforementioned thickness, the case becomes excessively deformable, so that the impact absorption effect declines. On the other hand, if the case is thicker than the aforementioned thickness, the cartridge is difficult to deform, so that the impact force is transmitted directly to the accommodated cartridges. In this construction, since the sheet thickness of the plastic resin is set to the aforementioned thickness, the formation of optimal impact absorbing portions (crushable zones) becomes possible.

[0026] (9) The cartridge accommodating case according to any one of (1) to (8) above, the upper case and the lower case have an identical structure for forming the partitioned chamber by engaging with each other and each have a tapered shape in a direction away from an engaging portion thereof, and biting preventing means are provided which have different shapes at portions at diagonally opposing positions within a range of a peripheral edge portion of the case.

[0027] According to this cartridge accommodating case, as compared with the case where the plurality of cartridges are dispersedly accommodated in the same accommodation area, by the portion in which the plurality of cartridges are accommodated by being put together in a block, it becomes possible to secure a surplus area which does not contribute to the accommodation. This surplus area portion can be made use of as an impact absorbing portion (so-called crushable zone). Further, it becomes unnecessary to accommodate the plurality of cartridges individually in the conventional manner, and the plurality of cartridges held by being superposed one on top of another in their thicknesswise direction can be collectively accommodated in the partition chamber. In addition, since each of the upper case and the lower case having an identical structure has in its surplus portion a tapered shape in a direction away from an engaging portion thereof, when a plurality of empty upper cases and lower cases are stacked, the cases are consecutively fitted into each other by virtue of the tapered shapes and can be stacked compactly, thereby extremely facilitating their accommodation and movement. Furthermore, when the cases in a stacked state are separated one by one, since the cases are held without excessively biting onto each other, the separation can be effected easily by virtue of the biting preventing means which are provided with different shapes at portions at diagonally opposing positions within the range of peripheral edge portions of the cases.

[0028] (10) The cartridge accommodating case according to any one of (1) to (9) above, wherein each of the biting preventing means is a portion of a cushioning rib which is projectingly formed on an outer side surface including the range of the peripheral edge portion of the case.

[0029] According to this cartridge accommodating case, since cushioning ribs are disposed which are projectingly formed on the outer side surface including the range of the peripheral edge portion of the case, and the cushioning ribs at diagonally opposing positions are provided with different shapes, impact absorption can be effected reliably. Also, when the cases in the stacked state are separated one by one, since the cases are held without excessively biting onto each other, the separation can be effected easily.

[0030] According to the cartridge accommodating case in accordance with the invention, with respect to the upper case and the lower case integrated by being superposed on each other, mutually moving-away forces can be respectively caused to act by holding the tabs provided on the peripheral edges of the respective cases and moving them in mutually opposite directions. Even in a case where the engagement is firm, it becomes possible to disengage the both cases and easily open the accommodating case only when it is required to do so. In other words, the cases can be reliably engaged

with each other with such a large engaging force that the disengagement would be difficult if the tabs were not provided.

[0031] According to the cartridge accommodating case in accordance with (9) and (10) above, when the upper cases and the lower cases are stacked or separated one by one before the accommodation of the cartridges or after the removal of the cartridges, the cases are fitted to each other to a certain degree to facilitate handling of their accommodation and movement. Additionally, since the biting of the cases onto each other is prevented appropriately, the cases can be separated easily. Since the partitioned chamber is formed for holding the cartridge group formed into a block by juxtaposing the plurality of cartridges in their thicknesswise direction, as compared with the case where the plurality of cartridges are dispersedly accommodated in the same accommodation area, by the portion in which the plurality of cartridges are put together in one block, it becomes possible to secure a surplus area which does not contribute to the accommodation. By using this surplus area portion as an impact absorbing portion (so-called crushable zone), it is possible to absorb the impact such as at the time of the dropping of the case and improve the impact resistance against the cartridges. In addition, since it is not necessary to accommodate the plurality of cartridges individually, the plurality of cartridges superposed and held in their thicknesswise direction can be collectively accommodated in the partitioned chamber, and accommodation can be performed efficiently in a short time, thereby making it possible to substantially improve the efficiency in the accommodating operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] FIG. **1** is an exploded perspective view in which an upper case and a lower case of an accommodating case in accordance with the invention are separated;

[0033] FIGS. **2**A and **2**B are explanatory diagrams of the upper case shown in FIG. **1**, in which FIG. **2**A is a plan view thereof and FIG. **2**B is a side view thereof;

[0034] FIG. **3** is a side view taken in the direction of arrow A in FIG. **2**A;

[0035] FIG. **4** is an external view of essential portions of the accommodating case, illustrating cushioning ribs provided on outer wall surfaces of a partitioned chamber;

[0036] FIG. **5** is an enlarged view of an essential portion, illustrating a tab provided projectingly on a bevel portion of an accommodating case flange;

[0037] FIG. **6** is a perspective view of essential portions, illustrating the mutual positional relationship of the respective tabs of the upper case and the lower case engaged with each other;

[0038] FIG. **7** is an enlarged cross-sectional view illustrating the shapes of a recessed portion and a protruding portion;

[0039] FIG. **8** is a perspective view illustrating a conventional accommodating case;

[0040] FIG. **9** is a front view of the upper case and the lower case when they are superposed on each other after the cartridge accommodating case shown in FIG. **1** has been used;

[0041] FIG. **10** is a rear view of the upper case and the lower case when they are superposed on each other after the cartridge accommodating case shown in FIG. **1** has been used;

[0042] FIG. **11** is a plan view after the upper case and the lower case shown in FIG. **9** have been superposed on each other; and

[0043] FIG. **12** is a rear view after the upper case and the lower case shown in FIG. **10** have been superposed on each other.

DETAILED DESCRIPTION OF THE INVENTION

[0044] Referring now to the accompanying drawings, a description will be given of the preferred embodiments of the cartridge accommodating case in accordance with the invention.

[0045] FIG. **1** is an exploded perspective view in which an upper case and a lower case of the accommodating case in accordance with the invention are separated. FIGS. **2**A and **2**B are explanatory diagrams of the upper case shown in FIG. **1**, in which FIG. **2**A is a plan view thereof and FIG. **2**B is a side view thereof. FIG. **3** is a side view taken in the direction of arrow A in FIG. **2**A.

[0046] A cartridge accommodating case (hereafter simply referred to as the "accommodating case") **100** in accordance with this embodiment can be suitably used for accommodating flat body-shaped cartridges **21** in each of which, for example, a reel with a magnetic tape wound therearound is disposed.

[0047] The cartridge **21** has the magnetic tape-wound reel provided therein such that its axis is oriented in the thicknesswise direction. In this embodiment, a description is given by citing an example in which the cartridge **21** is formed in the shape of a flat body which is square in a plan view, but the cartridge may be alternatively formed in the shape of a rectangular flat body.

[0048] The accommodating case **100** becomes openable as an upper case **23** and a lower case **25**, which are of the same structure, are superposed on each other from above and below and engaged with each other. As the upper case **23** and the lower case **25** are engaged, a plurality of partitioned chambers **27** are adapted to be formed therein. In this embodiment, four partitioned chambers **27** are formed. Cartridge groups **29**, which are each formed into a block by juxtaposing the plurality of cartridges **21** in their thicknesswise direction as shown in FIG. **1**, can be held in the respective partitioned chambers **27**. It should be noted that the cartridges **21** are uprightly disposed in such an orientation that their tape taking-out ports are set on the upper side, as shown in FIG. **1**, so that the tape taking-out ports having weak strength are located on the upper side when the cartridges **21** are accommodated in the accommodating case **100**. More preferably, the cartridges **21** are disposed such that the tape taking-out ports in two adjacent pairs of the partitioned chambers **27** face each other. In that case, the tape taking-out ports are provided on the interior side of the accommodating case **100**, and therefore the tape taking-out ports can be protected from an impact from outside of the case.

[0049] In this embodiment, one partitioned chamber **27** forms a substantially identical accommodation volume as the volume of the cartridge group **29**. Accordingly, even if the cartridges **21** are packed haphazardly in each partitioned chamber **27**, since there are no partition walls for the individual cartridges, the cartridges **21** can be put in easily. For example, several cartridges **21** can be grasped together and packed, so that the efficiency of accommodating opera-

tion is improved remarkably as compared with the conventional arrangement in which the cartridges **21** are grasped and inserted one by one.

[0050] Each partitioned chamber **27** has a shape in which its side walls are slightly tapered inwardly of the accommodating **100** as the side walls extend away from the engaging edge portions of the upper case **23** and the lower case **25**. Therefore, before the accommodation of the cartridges **21** or after the removal of the cartridges **21**, when the plurality of empty upper cases **23** and lower cases **25** are stacked and handled as a batch, the cases are consecutively fitted into each other by virtue of the tapered shapes of the partitioned chambers **27** and can be stacked compactly, thereby extremely facilitating their accommodation and movement.

[0051] As compared with the case where the plurality of cartridges **21** are dispersedly accommodated in the same accommodation area, by the portion in which the plurality of cartridges **21** are accommodated by being put together in blocks, it becomes possible to secure a surplus area which does not contribute to the accommodation. In the accommodating case **100**, this surplus area portion is made use of as an impact absorbing portion (so-called crushable zone).

[0052] As portions of the surplus area portions, first cushioning ribs **39** are formed on outer wall surfaces of the partitioned chambers **27** making up the side surfaces of the accommodating case **100** in the thicknesswise direction of the cartridges **21** accommodated in the partitioned chambers **27**. In this embodiment, two first cushioning ribs **39** are formed outwardly projectingly on one side wall surface of each partitioned chamber **27** corresponding to the thicknesswise direction of the cartridges **21**. Furthermore, second cushioning ribs **35** are formed on the other side wall surfaces of the accommodating case **100** corresponding to a direction perpendicular to the thicknesswise direction of the cartridges **21**. Similarly, two second cushioning ribs **35** are formed outwardly projectingly for each partitioned chamber **27**. These first and second cushioning ribs **39** and **35** are molded simultaneously when the accommodating case **100** is molded from a flexible resin.

[0053] The respective cushioning ribs **39** and **35** have outwardly protruding shapes provided with the aforementioned inwardly tapered shapes along their longitudinal direction away from the engaging edge portions of the upper case **23** and the lower case **25**. In the event that an object has collided against the partitioned chamber **27** from the outside to apply an impact in the thicknesswise direction of the cartridges **21**, the first cushioning ribs **39** are able to absorb the impact by being deflected by themselves. Similarly, in the event that an object has collided against the partitioned chamber **27** from the outside to apply an impact in the widthwise direction of the cartridges **21**, the second cushioning ribs **35** are able to absorb the impact by being deflected by themselves. Namely, gaps are formed between the outer wall surface of the case and the cartridges **21** by the first cushioning ribs **39** and the second cushioning ribs **35**, and these cushioning ribs **39** and **35** defining these gaps serve as a cushioning material, and are adapted to enhance the impact resistance.

[0054] The second cushioning ribs **35** are included in the range of peripheral edge portions of, for instance, the lower case **25**, and are constructed such that, on the front side (on the lower right-hand side in FIG. **1**) of the lower case **25**, in terms of their inner depth the two ribs in the center (second cushioning ribs **35***a*) are stepped to be shallow, and the two ribs on both outer sides thereof are deep. In contrast, on the rear side of the lower case **25**, in terms of their inner depth the two ribs in the center are deep, and the two ribs on both outer sides thereof (second cushioning ribs **35***b*) are stepped to be shallow. Namely, the arrangement provided is such that the stepped shallow cushioning ribs and the deep cushioning ribs on the front side and counterparts on the rear side are positionally offset from each other diagonally. The upper case **23** is also constructed in the same way as the lower case **25**, such that, on the rear side thereof, in terms of their inner depth the two ribs in the center are stepped to be shallow, and the two ribs on both outer sides thereof are deep. In contrast, on the front side of upper case **23**, in terms of their inner depth the two ribs in the center are deep, and the two ribs on both outer sides thereof are stepped to be shallow. In these second cushioning ribs **35***a* and **35***b*, the stepped portions on the inner depth side serve as stoppers **42** which are biting preventing means.

[0055] When the plurality of empty upper cases **23** and lower cases **25** are stacked before the accommodation of the cartridges **21** or after the removal of the cartridges **21**, the stoppers **42** function such that when the second cushioning ribs **35** not provided with the stoppers **42** are inserted over the second cushioning ribs **35***a* and **35***b* provided with the stoppers **42** and configured shallowly, the second cushioning ribs **35** not provided with the stoppers **42** abut against the stoppers **42**, thereby preventing at that position further insertion of the second cushioning ribs **35** not provided with the stoppers **42**.

[0056] Thus, when the cases **23** and **25** in a stacked state are separated one by one, since the cases **23** and **25** are held without excessively biting onto each other, the separation can be effected easily by virtue of the biting preventing means which are provided with different shapes at portions (second cushioning ribs) at diagonally opposing positions within the range of peripheral edge portions of the cases **23** and **25**.

[0057] In addition, third cushioning ribs **37** are respectively formed at corners of the partitioned chambers **27** in such a manner as to surround ridge line portions of the respective cartridges **21**. Since the third cushioning ribs **37** are respectively disposed at ends where the side provided with the first cushioning ribs **39** and the side provided with the second cushioning ribs **35** meet, it is possible to effectively prevent the deformation of the ridge line portions of the cartridges such as when the accommodating case **100** with the cartridges **21** accommodated therein has dropped.

[0058] Here, as parts of surplus portions which are created due to the fact that the plurality of cartridges **21** are collectively accommodated in blocks, flanges **31** having the function of impact absorption respectively extend transversely on both end sides, in the axial direction of the magnetic tape-wound reel, of the upper case **23** and the lower case **25**. A handle opening **33** for defining a handle for carrying the case is provided in the respective flange **31**. Namely, the arrangement provided is such that, as for the accommodating case **100** with the upper case **23** and the lower case **25** engaged with each other, the user is able to put his or her fingers into the handle opening **33** on one side and grip the handle to carry the accommodating case **100** with the other flange **31** side facing downward. Alternatively, the accommodating case **100** can be carried by gripping the

handles defined by the handle openings **33** on both sides with both hands and by setting the accommodating case **100** horizontally.

[0059] When the accommodating case **100** is carried by gripping the handle defined by the handle opening **33** on one side with one hand with the other flange **31** side facing downward, if and when the accommodating case **100** slips off the fingers, the accommodating case **100** at the lower flange **31** side collides against the floor surface. At this time, the flanges **31**, which serve as impact absorbing portions, are deformed by the load of the accommodating case **100** and the cartridge groups **29**, and the impact energy is absorbed by that deformation, thereby alleviating the impact for the accommodated cartridges **21**.

[0060] Generally, the cartridges **21** are weak against an impact applied in the axial direction of the reel. This is because there are cases where the jumping out of the tape has occurred at an end face of the wound tape, and if the tape is crushed or bent as a tape end abuts against a reel flange due to the jumping out of the tape, the smooth taking-up and paying-out of the magnetic tape is hampered, making the read/write impossible in a worst case. In this embodiment, as the flanges **31** serving as the impact absorbing portions are disposed in the axial direction of the reel of the cartridge **21**, the impact resistance in the axial direction of the reel, which is weak against the impact, can be improved.

[0061] FIG. **4** is an external view of essential portions of the accommodating case, illustrating the cushioning ribs provided on the outer wall surfaces of the partitioned chamber. The cushioning ribs **35** and **39** are formed on the wall surfaces of each partitioned chamber **27** in such a manner as to protrude outwardly from the partitioned chamber **27**. Accordingly, even if an object has collided against the accommodating case **100** from outside, since a gap is formed between the outer wall surface of the case and the cartridges **21** by the cushioning ribs **35** and **39**, these cushioning ribs **35** and **39** act as a cushioning material to enhance the impact resistance. Particularly at the corners of the partitioned chambers **27**, the cushioning ribs **37** which surround the ride line portions of the cartridges **21** are formed as shown in FIG. **4**. Thus, an impact absorbing function is provided for effectively preventing the deformation of the ridge line portions of the cartridges in cases such as where the accommodating case **100** has dropped with the cartridges **21** accommodated therein.

[0062] The accommodating case **100** is comprised of the upper case **23** and the lower case **25** of an identical structure, which are each provided with a protruding portion (protrusion) **41** and a recessed portion (recessed groove) **43** which are adapted to engage with counterparts of another case. In this embodiment, in the peripheral portion surrounding the four partitioned chambers **27**, the protrusion **41** and the recessed groove **43** are formed on the upper side and the lower side, respectively, symmetrically about a case center line **45** shown in FIG. **2**. Namely, on each of the upper case **23** and the lower case **25**, the protrusion **41** and the recessed groove **43**, which are both U-shaped in a plan view, are formed continuously on one side and on the other side, respectively, with the center line **45** located therebetween.

[0063] When the upper case **23** and the lower case **25** of the identical structure are combined vertically, the protrusions **41** are fitted into the recessed grooves **43** and are engaged with each other. As a result, the partitioned chambers **27** are hermetically sealed, so that water resistance can be obtained, and the accommodating case **100** is capable of floating on water. In addition, the cartridges **21** can be protected from dust, moisture, splashed water, and other harmful substances. Namely, one case is used both as a cover and as a part of the body. Thus, by using one kind of cases which have been molded by one mold, the accommodating case **100** is structured in which the partitioned chambers **27** which are openable by the protrusions **41** and the recessed grooves **43** are formed.

[0064] In addition, a partition portion **47** is provided adjacent ones of the partitioned chambers **27**. This partition portion **47** is formed with a shape and a depth, which will be described later, so that its deformation with respect to an impact is facilitated. Namely, when the accommodating case **100** has dropped, the impact is alleviated as the partition portions **47** are deformed. The partition portions **47** are provided in any directions so that the dropping direction may be from the side where the flange **31** is provided or from a perpendicular direction thereto. In this embodiment, criss-cross partition portions **47** are formed in such a manner as to partition the interior of the accommodating case **100** into the four partitioned chambers **27** disposed on four sides.

[0065] The accommodating case **100** is so arranged that as the partition portions **47** are interposed between adjacent ones of the partitioned chambers **27** in which the cartridge groups **29** are accommodated, even in cases where impacts are applied to the respective cartridge groups **29** due to dropping or the like, the partition portions **47** are adapted to absorb the impacts, so that an impact force due to the inertia of the cartridge groups **29** does not affect the cartridge groups **29** between each other.

[0066] FIG. **5** is an enlarged view of an essential portion, illustrating a tab provided projectingly on a bevel portion of the accommodating case flange. FIG. **6** is a perspective view of essential portions, illustrating the mutual positional relationship of the respective tabs of the upper case and the lower case engaged with each other.

[0067] There are cases where the accommodating case **100** with the cartridge groups **29** accommodated therein is accommodated in an unillustrated corrugated cardboard box having an inner shape substantially identical to the outer shape of the accommodating case **100**. For this reason, to improve the feature of taking out from the corrugated cardboard box, a bevel portion **49** is formed at each opposite end of the flange **31**, the bevel portion **49** being constituted by a side portion which is inclined approximately 45 degrees relative to the flange **31**. As a result, as for the accommodating case **100** accommodated in the corrugated cardboard box, triangular holes are respectively formed by these bevel portions **49** with respect to the inner wall surfaces of the corrugated cardboard box, so that fingers can be inserted therein to facilitate the taking-out operation.

[0068] Tabs **51** are extendedly provided on the respective peripheral edges, i.e., the flanges **31**, of the upper case **23** and the lower case **25**. In this embodiment, each of the upper case **23** and the lower case **25** is formed by a quadrangular outer shape having four corner portions at its periphery. At at least one corner portion of each of the upper case **23** and the lower case **25**, the bevel portion **49** is formed by removing this corner portion along the inclined side. In addition, at least one tab **51** is formed on the inner side of a quadrangular region enveloping the four outer sides of each of the cases **23** and **25**. If the tab **51** is extendedly provided on this bevel portion **49** so as not to project from

the aforementioned quadrangular region, even if the accommodating case **100** is accommodated in a corrugated cardboard box having the same inner shape as the outer shape of the case, the tab **51** does not hinder the accommodation.

[0069] With the accommodating case **100**, with respect to the upper case **23** and the lower case **25** integrated by mutually engaging the protrusions **41** and the recessed grooves **43**, it is easily possible to cause opening forces to act by holding the tabs **51** provided at the peripheral edges of the respective cases and moving them in mutually opposite directions. In other words, the cases can be reliably engaged with each other with such a large engaging force that the disengagement would be difficult if the tabs **51** were not provided.

[0070] In this embodiment, the bevel portions **49** are respectively formed at the four corner portions. In addition, in this embodiment, the tabs **51** are respectively provided at the pairs of bevel portions **49** with the center line **45** (shown in FIG. **2**) located therebetween. The tabs **51** are each disposed in such a manner as to be offset from the center of the inclined side of the bevel portion **49**. Namely, as shown in FIG. **5**, the tab **51** is offset toward one side from the center of the bevel portion **49**. In the case of the upper case **23** shown in FIG. **2**, for example, the tab **51** which is extendedly provided at the bevel portion **49** at upper left is offset diagonally downward toward left, and the tab **51** which is extendedly provided at the bevel portion **49** at upper left is offset diagonally downward toward right.

[0071] When the upper case **23** and the lower case **25** of the identical structure molded by the same mold are superposed one on top of the other vertically with the partitioned chambers **27** formed therein, as shown in FIG. **1**, the tabs **51** do not completely overlap with each other, and are disposed in a state of being offset along the inclined side. As a result, as the both tabs **51** are moved away from each other in vertically opposite directions, the upper case **23** and the lower case **25** can be easily disengaged.

[0072] FIG. **7** is an enlarged cross-sectional view illustrating the shapes of the recessed portion and the protruding portion.

[0073] As described above, as the tabs **51** are provided, the protrusions **41** and the recessed grooves **43** can be provided with a structure whereby they can be engaged with a higher engaging force than in a case where the tabs **51** are not provided. Specifically, the opening width W**1** of the recessed groove **43** can be formed to be slightly smaller than the width W of the protrusion **41**. In this case, since both the upper case **23** and the lower case **25** are formed of a soft material, the case members are mutually deformed, and are firmly fitted to each other. In addition, the protrusion **41** may be formed in a tapered shape in which the width W of its projecting distal end is wide and the width W**2** of its proximal end is slightly small. In this case, the recessed groove **43** is formed as a tapered groove in which the width W**3** of the groove bottom is equal to the width W of the projecting distal end of the protrusion **41**. By forming the protrusion **41** and the recessed groove **43** with such a slightly tapered shape, it is possible to impart a high engaging force while ensuring high sealability.

[0074] Further, at an outermost periphery of each of the upper case **23** and the lower case **25**, a stepped bent portion is formed by slightly bending its peripheral edge. In the same way as the aforementioned protrusion **41** and recessed groove **43**, this stepped bent portion is formed on either side symmetrically about the center line **45**. In consequence, when the upper case **23** and the lower case **25** are superposed on each other, the stepped bent portion covers the peripheral edge of the other case so as to improve dust-tightness and water-tightness.

[0075] Furthermore, large and small quadrangular frame portions **53***a* and **53***b*, which are capable of fitting to counterparts of the other case, protrude from outer bottom surface portions of the respective partitioned chambers **27**. As a result, even if the accommodating cases **100** are stacked vertically, the quadrangular frame portions **53***a* and **53***b* on the lower surface of the upper accommodating case **100** are fitted to the quadrangular frame portions **53***a* and **53***b* on the upper surface of the lower accommodating case **100** to restrict their relative lateral offset, thereby preventing a collapse at the time of stacking.

[0076] Each of the upper case **23** and the lower case **25** is constituted by an integrally molded piece of a plastic resin. For this reason, the upper case **23** and the lower case **25** having toughness for reliably protecting the cartridges as well as appropriate impact absorption can be mass produced easily at low cost by using a material which is relatively easy to handle.

[0077] This plastic resin may include any one of, for example, polyethylene terephthalate, polypropylene, and polystyrene. As the plastic resin is any one of polyethylene terephthalate, polypropylene, and polystyrene, the material is easily available, recovery and reuse after the products have become waste products are possible, and easy and low-cost vacuum molding is possible.

[0078] In addition, the plastic resin should preferably be translucent. If so, when the upper case **23** and the lower case **25** are engaged with each other, and the partitioned chambers **27** are set in the hermetically sealed state, the cartridges **21** accommodated in the partitioned chambers **27** are visible from the outside, so that the state of accommodation of the cartridges **21** in the hermetically sealed partitioned chambers **27** can be easily grasped.

[0079] In addition, as each of the upper case **23** and the lower case **25** is formed by using a plastic resin sheet having a thickness of 0.5 to 2.0 mm and subjecting it to drawing, the minimum structural strength of the partitioned chambers for accommodating the plurality of cartridge groups can be economically ensured. Further, the overall weight of the case can be set to a minimum while satisfying the minimum strength. In addition, as the case is formed with the aforementioned thickness, appropriate deformation becomes possible when an external force is applied, thereby making it possible to optimally secure the impact absorbing action with respect to the accommodated cartridges. In other words, if the case is thinner than the aforementioned thickness, the case becomes excessively deformable, so that the impact absorption effect declines. On the other hand, if the case is thicker than the aforementioned thickness, the cartridge is difficult to deform, so that the impact force is transmitted directly to the accommodated cartridges. In this construction, since the sheet thickness of the plastic resin is set to the aforementioned thickness, the formation of optimal impact absorbing portions (crushable zones) becomes possible.

[0080] The above-described accommodating case **100** is accommodated in the unillustrated corrugated cardboard box having an inner shape substantially identical to the outer shape of the accommodating case **100**. When the accom-

modating case **100** is removed from the corrugated cardboard box after being opened, the accommodating case **100** can be easily pulled out by inserting fingers or the like into the handle opening **33** formed in the flange **31**. In addition, to improve the feature of taking out from the corrugated cardboard box, the bevel portion **49** is formed at each opposite end of the flange **31**, the bevel portion **49** being constituted by the side portion which is inclined approximately 45 degrees relative to the flange **31**. As a result, as for the accommodating case **100** accommodated in the corrugated cardboard box, triangular holes are respectively formed by these bevel portions **49** with respect to the inner wall surfaces of the corrugated cardboard box, so that fingers can be inserted therein to facilitate the taking-out operation.

[0081] As for the above-described accommodating case **100**, in the empty state before the accommodation or removal of the cartridges **21**, the upper case **23** is rotated 180 degrees upside down as shown in FIG. **1**, and is superposed on the inner side of the lower case **25**.

[0082] As shown in FIG. **9**, before the rotated upper case **23** is superposed, as for the second cushioning ribs **35** on the front side, the two ribs in the center are deep, and the two ribs on both outer sides thereof (second cushioning ribs **35***b*) are shallow with the stoppers **42**. Meanwhile, in the case of the lower case **25** which is not rotated, as for the second cushioning ribs **35** on the front side, the two ribs in the center (second cushioning ribs **35***a*) are shallow with the stoppers **42**, and the two ribs on both outer sides thereof are deep.

[0083] As shown in FIG. **10**, before the rotated upper case **23** is superposed, as for the second cushioning ribs **35** on the rear side, the two ribs in the center (second cushioning ribs **35***a*) are shallow with the stoppers **42**, and the two ribs on both outer sides thereof are deep. Meanwhile, in the case of the lower case **25** which is not rotated, as for the second cushioning ribs **35** on the rear side, the two ribs in the center are deep, and the two ribs on both outer sides thereof (second cushioning ribs **35***b*) are shallow with the stoppers **42**.

[0084] As shown in FIG. **11**, at the time when the upper case **23** is superposed on the inner side of the lower case **25**, the second cushioning ribs **35** of the upper case **23** are inserted over the second cushioning ribs **35** of the lower case **25**, and on their front sides the distal ends of the two central ribs of the second cushioning ribs **35** of the upper case **23** respectively abut against the stoppers **42** of the two central ribs (second cushioning ribs **35***a*) of the second cushioning ribs **35** of the lower case **25**.

[0085] As shown in FIG. **12**, at the time when the upper case **23** is superposed on the inner side of the lower case **25**, the second cushioning ribs **35** of the upper case **23** are inserted over the second cushioning ribs **35** of the lower case **25**, and on their rear sides the distal ends of the two ribs on both outer sides of the second cushioning ribs **35** of the upper case **23** respectively abut against the stoppers **42** of the two ribs on both outer sides (second cushioning ribs **35***b*) of the second cushioning ribs **35** of the lower case **25**. As a result, since the second cushioning ribs **35** are prevented from being further inserted below the position of abutment against the stoppers **42**, the upper case **23** is held at a position where its both flanges **31** are spaced away from those of the lower case **25**. Consequently, the upper case **23** and the lower case **25** which are superposed after use are not brought into close contact with each other on their overall surfaces, and a large space can be secured between their upper and lower flanges **31**. Thus, the upper case **23** can be easily separated from the lower case **25** by such as pulling up the flange **31** of the upper case **23**. It should be noted that after pluralities of upper cases **23** and lower cases **25** have been consecutively stacked in the same way as described above, they can be easily separated one by one.

[0086] Although in this embodiment the stoppers **42** are formed in the second cushioning ribs **35***a* and **35***b* as the biting preventing means, it is possible to impart different shapes to portions at such diagonally opposing positions insofar as they are within the range of peripheral edge portions of the cases **23** and **25** and do not affect the engagement of the cases.

[0087] Therefore, according to the above-described cartridge accommodating case **100**, at least one partitioned chamber **27** is formed for holding the cartridge group **29** formed into a block by juxtaposing the plurality of cartridges **21** in their thicknesswise direction. Hence, as compared with the case where the plurality of cartridges **21** are dispersedly accommodated in the same accommodation area, by the portion in which the plurality of cartridges **21** are put together in one block, it becomes possible to secure surplus areas which do not contribute to the accommodation. By using these surplus area portions as impact absorbing portions (so-called crushable zones), it is possible to absorb the impact such as at the time of the dropping of the case and improve the impact resistance against the accommodated cartridges **21**.

[0088] In addition, since it is not necessary to accommodate the plurality of cartridges **21** individually, the plurality of cartridges **21** superposed and held in their thicknesswise direction can be collectively accommodated in the partitioned chamber **27**, and accommodation can be performed efficiently in a short time, thereby making it possible to substantially improve the efficiency in the accommodating operation.

[0089] Furthermore, according to the above-described cartridge accommodating case **100**, with respect to the upper case **23** and the lower case **25** integrated by mutually engaging the protrusions **41** and the recessed grooves **43**, mutually moving-away forces can be respectively caused to act by holding the tabs **51** provided on their peripheral edges and moving them in mutually opposite directions. Even in a case where the engagement is firm, it becomes possible to disengage the protrusions **41** and the recessed grooves **43** from each other and easily open the accommodating case **100** only when it is required to do so. In other words, the cases can be reliably engaged with each other with such a large engaging force that the disengagement would be difficult if the tabs **51** were not provided.

[0090] It should be noted that although in the above-described embodiment an example has been described in which the upper case **23** and the lower case **25** are molded by the same mold and are of an identical structure, the accommodating case in accordance with the invention may be one in which the upper case and the lower case molded by different molds and having different structures are combined. In this case as well, an advantage is offered in that it is possible to obtain excellent case openability similar to the one described above.

[0091] In addition, according to the above-described cartridge accommodating case **100**, after it been used and the cartridges **21** have been removed, when the upper case **23** and the lower case **25** are superposed on each other and are

then separated from each other, the both cases **23** and **25**, which have not bitten onto each other, can be easily separated from each other.

[0092] This application is based on Japanese Patent application JP 2006-20750, filed Jan. 30, 2006, and Japanese Patent application JP 2006-23192, filed Jan. 31, 2006, the entire contents of which are hereby incorporated by reference, the same as if set forth at length.

What is claimed is:

1. A cartridge accommodating case for accommodating flat body-shaped cartridges in each of which a reel with a magnetic tape wound therearound is disposed, comprising:

an upper case; and

a lower case, the upper case and the lower case being adapted to be superposed on each other to form at least one partitioned chamber for holding a cartridge group formed into a block by juxtaposing a plurality of cartridges in a thicknesswise direction thereof,

wherein a tab is extendedly provided on a peripheral edge of each of the upper case and the lower case.

2. The cartridge accommodating case according to claim **1**, wherein each of the upper case and the lower case is formed by a quadrangular outer shape having four corner portions at its periphery, and a bevel portion is formed at at least one corner portion of each of the upper case and the lower case by removing the corner portion along an inclined side, the tab being formed on the bevel portion.

3. The cartridge accommodating case according to claim **2**, wherein the tab extendedly provided on the bevel portion is formed on an inner side of a quadrangular region enveloping four outer sides of the case.

4. The cartridge accommodating case according to claim **2**, wherein the bevel portion is formed at at least two adjacent ones of the corner portions, and the tabs extendedly provided respectively at the two corner portions are each disposed in such a manner as to be offset from a center of the inclined side of the bevel portion.

5. The cartridge accommodating case according to claim **1**, wherein each of the upper case and the lower case is constituted by an integrally molded piece of a plastic resin.

6. The cartridge accommodating case according to claim **5**, wherein the plastic resin includes at least one of polyethylene terephthalate, polypropylene, and polystyrene.

7. The cartridge accommodating case according to claim **5**, wherein the plastic resin is translucent.

8. The cartridge accommodating case according to claim **5**, wherein each of the upper case and the lower case is formed by subjecting a plastic resin sheet having a thickness of from 0.5 to 2.0 mm to drawing.

9. The cartridge accommodating case according to claim **1**, wherein the upper case and the lower case have an identical structure for forming the partitioned chamber by engaging with each other and each have a tapered shape in a direction away from an engaging portion thereof, and biting preventing means are provided which have different shapes at portions at diagonally opposing positions within a range of a peripheral edge portion of the case.

10. The cartridge accommodating case according to claim **9**, wherein each of the biting preventing means is a portion of a cushioning rib which is projectingly formed on an outer side surface including the range of the peripheral edge portion of the case.

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