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Flow structure of companion animal dust collector

Abstract

The present invention relates to a flow structure of a companion animal duct collector, and more particularly, to a flow structure of a companion animal duct collector including a main body part that includes an inner case through which air or hair of a companion animal is introduced and an outer case surrounding front and rear surfaces of the inner case and discharging air moving through the inner case to the outside, a suction fan unit that has a motor fan inside the inner case, and a suction grill unit that includes a suction grill coupled to one side of the outer case and sucking in external air by the operation of the suction fan unit, whereby air is collected to the other side of the main body part to form a low pressure part, thereby forming an additional air flow by the operation of the suction fan unit.

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Background/Summary

TECHNICAL FIELD

(1) The present invention relates to a flow structure of a companion animal dust collector, and more particularly, to a flow structure of a companion animal dust collector that operates a suction fan unit to suck hairs of companion animals scattered in the air into one side of a main body part and collect purified air to the other side of the main body part so as to lower air pressure and discharge the purified air.

BACKGROUND ART

(2) Recently, the population raising companion animals such as dogs and cats is increasing as the rate of low birth rates and one- or two-person households increases.

(3) As a result, various products such as bathtubs, playgrounds, exercise equipment, and beauty equipment used exclusively for companion animals are being developed and released, and product development for functional improvement is actively progressing.

(4) Meanwhile, dogs or cats should be bathed frequently and groomed. This is because if bathing and hair care are not done properly, the hairs get together and cause skin diseases or odors, and the lost hairs scatter in the air, causing allergies or respiratory diseases.

(5) For this reason, beauty equipment that may keep the surrounding environment clean by combing or brushing hairs of companion animals and at the same time sucking sheared or missing hairs has been developed.

(6) However, the conventional beauty equipment does not have a function of drying hairs of companion animals, so there is a hassle of having to have a separate dryer.

(7) Therefore, there is a need for a management device capable of shaving or brushing hairs of companion animals, sucking groomed hairs, and drying the hairs of the companion animals.

(8) In addition, there is a need for a management device that strongly sucks and collects companion animal hairs scattered in the air, and discharges only air from which hairs are separated to dry companion animal hairs.

RELATED ART DOCUMENT

Patent Document

(9) (Patent Document 1) Korean Patent No. 10-2234350 (registered on Mar. 25, 2021)

DISCLOSURE

Technical Problem

(10) The present invention proposes to solve the problems of the related art as described above, and provides a novel flow structure of a companion animal dust collector that operates a suction fan unit to suck companion animal's hair scattered in the air into one side of a main body part and collect purified air to the other side of the main body part so as to lower air pressure and discharge the purified air.

(11) In addition, the present invention provides a flow structure of a companion animal dust collector capable of rotating air introduced into one side of an inner case with an air rotation unit to guide the air around a suction grill unit to an inside of the inner case, and increasing the amount of air moving the rotated air to the other side of the inner case through an air moving unit.

(12) In addition, the present invention provides a flow structure of a companion animal dust collector that moves air introduced into a suction grill unit to front and rear sides of an inner case so that the air moves to an inside and outside of the inner case, respectively, and collects the air to the other side of an outer case to form a low pressure part further lowering an air pressure, further increase the amount of air, and discharge the air to the outside.

Technical Solution

(13) To solve the above problem, the present invention provides a flow structure of a companion

animal dust collector, including: a main body part that includes an inner case through which air or hair of a companion animal is introduced and an outer case surrounding front and rear surfaces of the inner case and discharging air moving through the inner case to the outside; a suction fan unit that has a motor fan inside the inner case; and a suction grill unit that includes a suction grill coupled to one side of the outer case and sucking in external air by the operation of the suction fan unit.

(14) The main body part may further include: a space part that collects air introduced into the suction grill unit to one side of the suction fan unit; and an air moving unit that includes first air moving units communicating with the space part and extending facing each other around the other side of the suction fan unit and a second air moving unit communicating with the space part on at least one side of the first air moving unit and extending to the other side of the suction fan unit.

(15) The air moving unit may further include a cyclone unit for rotating the moving air by forming a spiral protrusion on an inside of the second air moving unit.

(16) The air moving unit may lower a pressure of air discharged to the other side by forming a small area from one side toward the other side.

(17) The main body part may further include a plurality of moving guide parts that are arranged on at least one of the front and rear sides of the inner case to move the air introduced from the suction grill unit to the other side of the outer case.

(18) The main body part may form streamlined protrusions between the moving guide parts, respectively, to lower the pressure of air passing through the moving guide part.

(19) The main body part may further include a low pressure part that forms a lower air pressure on the other side of the outer case due to low pressure air discharged from the air moving unit and the air moving through the moving guide part.

(20) The main body part may further include an air rotating unit which radially arranges curved partition walls around the suction fan unit to form discharge holes and rotates the air introduced from the space part.

(21) The suction grill unit may further include an Air moving part that moves to at least one surface of the front and rear surfaces of the inner case by forming a body having a communication hole accommodated in the space part and communicating with the suction fan unit and forming a plurality of wall protrusions arranged on a bent surface of the body.

(22) The suction grill unit may further include a dust collecting filter unit that is disposed between the suction grill and the Air moving part to collect the hairs of the companion animal flowing into the suction grill when the companion animal is located on one side of the inner case.

Advantageous Effects

(23) According to the present invention, a flow structure of a companion animal dust collector operates a suction fan unit to suck companion animal's hair scattered in the air into one side of a main body part and collect purified air to the other side of the main body part so as to lower air pressure and discharge the purified air, thereby increasing the discharged amount of air by creating an additional air flow to the moving air by the operation of the suction fan unit.

(24) In addition, it is possible to rotate air introduced into one side of an inner case with an air rotation unit to guide the air around a suction grill unit to an inside of the inner case, and increase the amount of air moving the rotated air to the other side of the inner case through an air moving unit.

(25) In addition, air introduced into a suction grill unit moves to the inside and outside of the inner case, respectively, and is collected to the other side of the outer case, thereby forming a low pressure part that further lowers an air pressure and further increases the amount of air.

(26) In addition, by forming a heat discharge pipe that communicates with the other side of the inner case in the suction fan unit to discharge heat generated by an operation of an electric motor, it is possible to increase a suction force for sucking air into the suction grill unit due to a difference in temperature between the air flowing into one side of the inner case and hot air.

Description

DESCRIPTION OF DRAWINGS

- (1) FIG. 1 is a perspective view illustrating an appearance of a flow structure of a companion animal dust collector according to an embodiment of the present invention.
- (2) FIG. 2 is a cross-sectional view taken along line A-A' in FIG. 1.
- (3) FIG. 3 is an exploded perspective view of the flow structure of a companion animal dust collector according to the embodiment of the present invention.
- (4) FIG. 4 is an exploded cross-sectional perspective view of FIG. 3.
- (5) FIG. 5 is a bottom exploded cross-sectional perspective view illustrating FIG. 4 as a bottom view.
- (6) FIG. 6 is an exemplary view illustrating an air moving pipe and an air rotating unit of the flow structure of a companion animal dust collector according to the embodiment of the present invention.
- (7) FIG. 7 is an exemplary view illustrating a cyclone part and a streamlined protrusion of the flow structure of a companion animal dust collector according to the embodiment of the present invention.
- (8) FIG. 8 is an exemplary view illustrating a low pressure part of the flow structure of a companion animal dust collector according to the embodiment of the present invention.

BEST MODE

- (9) Hereinafter, embodiments will be described in detail with reference to the accompanying drawings so that they can be easily practiced by those skilled in the art to which the present invention pertains. However, in describing an operating principle of exemplary embodiments of the present invention, detailed descriptions of well-known functions or constructions will be omitted so as not to obscure the description of the present invention with unnecessary detail.
- (10) In addition, like or similar reference numerals denote parts performing similar functions and actions throughout the drawings.
- (11) A case in which any one part is connected with the other part includes a case in which the parts are directly connected with each other and a case in which the parts are indirectly connected with each other with other elements interposed therebetween. In addition, a phrase 'including any component' will be understood to imply the inclusion of other components rather than the exclusion of other component, unless explicitly described otherwise.
- (12) Hereinafter, a flow structure of a companion animal dust collector according to a preferred embodiment of the present invention will be described in detail with reference to the accompanying drawings.
- (13) As illustrated in FIG. 1, a flow structure **10** of a companion animal dust collector according to an embodiment of the present invention includes a main body part **100**, a suction fan unit **200**, and a suction grill unit **300**.
- (14) More specifically, as illustrated in FIGS. 1 and 2, the flow structure **10** of a companion animal dust collector according to an embodiment of the present invention includes a main body part **100** that includes an inner case **110** through which air or hair of a companion animal is introduced and an outer case **120** surrounding front and rear surfaces of the inner case and discharging air moving through the inner case to the outside, a suction fan unit **200** that has a motor fan inside the inner case, and a suction grill unit **300** that includes a suction grill **310** coupled to one side of the outer case and sucking in external air by the operation of the suction fan unit.
- (15) Referring to FIGS. 1 and 2, the main body part **100** is a device for collecting hairs by sucking air and hairs of companion animals scattered in the air to one side, and discharging purified air to the other side.
- (16) That is, the main body part **100** is located on one side of the companion animal, so that hair

scattered into the air during combing may be sucked. It is a device that dries the hairs of the companion animal with the purified air by placing the bathed companion animal on the other side. (17) To this end, the main body part **100** further includes an inner case **110**, an outer case **120**, a space part **130**, and an air moving unit **140**.

(18) Referring to FIGS. **3** and **4**, the inner case **110** introduces air and hair of a companion animal to one side based on the suction fan unit **200** to be described later, and forms the air moving unit **140** extending to the other side as an outer wall.

(19) The outer case **120** is spaced apart from the front and rear surfaces of the inner case **110** by a predetermined distance and coupled to surround them.

(20) To this end, the outer case **120** is formed of a first plate located on the front side of the inner case **110**, in which one side of the first plate is bent to be coupled to the other side of the inner case **110**. In addition, the bent portion is opened so that a cover part **400** and a lighting unit **500** to be described later may be coupled.

(21) In addition, the outer case **120** forms a second plate that is spaced apart from the rear surface of the inner case **110** by a predetermined distance and coupled thereto.

(22) The outer case **120** provides a closed space when moving the air introduced through the suction grill unit **300** to the other side of the inner case **110** along the front and rear surfaces of the inner case **110**, thereby forming a flow path that may be discharged to the discharge grill unit **420** formed in the cover part **400**.

(23) Referring to FIGS. **4** and **5**, the space part **130** forms a space on one side of the suction fan unit **200** to collect air introduced into the suction grill unit **300**.

(24) That is, the space part **130** is formed as a space for collecting air inside the inner case **110** extending in one direction with respect to the suction fan unit **200** and serves to move the air introduced through the suction grill unit **300** to an air rotating unit **190** and the air moving unit **140** to be described later.

(25) Referring to FIGS. **4** and **6**, the air moving unit **140** includes first air moving units **141** communicating with the space part **130** and extending facing each other around the other side of the suction fan unit **200** and a second air moving unit **142** communicating with the space part **130** on at least one side of the first air moving unit **141** and extending to the other side of the suction fan unit **200**.

(26) In addition, it is preferable that the air moving unit **140** lowers a pressure of air discharged to the other side by forming a small area from one side toward the other side.

(27) A space is formed inside the first air moving unit **141** to form an outer surface of the inner case **110** in the longitudinal direction. To this end, the air located in the space part **130** is introduced into and moves to the other side of the inner case **110** by extending facing each other around the other side of the suction fan unit **200**.

(28) In this case, the first moving unit **141** serves as a passage through which it can move at a higher speed by the rotational force of the air rotating by the air rotating unit **190**.

(29) The second air moving unit **142** communicates with the space part **130** on at least one side of the first air moving unit **141** and extends to the other side of the suction fan unit **200**, and as illustrated in the drawings herein, is preferably formed on both sides of the first air moving unit **141**.

(30) In particular, as illustrated in FIG. **6**, the air moving unit **140** may further include an air discharge hole **143**.

(31) The air discharge hole **143** forms a hole in the space part **140** to prevent a vortex phenomenon because the amount of air collected in the space part **130** is greater than a rate at which air is discharged, and moves some of the air to the front and rear surfaces of the inner case **110**.

(32) Meanwhile, as illustrated in FIG. **7**, in the flow structure **10** of a companion animal dust collector according to an embodiment of the present invention, the main body part **100** may further include a cyclone unit **150**.

(33) The cyclone unit **150** serves to rotate the moving air by forming a spiral protrusion on the inside of the second air moving unit **142**.

(34) That is, the cyclone unit **150** forms a spiral protrusion inside the second air moving unit **142** having a diameter smaller than that of the first air moving unit **141**, and rotates the air introduced from the space part **130** when moving to the other side of the inner case **110**.

(35) Due to this, the flow of air is accelerated to increase the volume of air collected on the other side of the inner case **110** and lower the pressure, so that the speed at which the air collected in the space part **130** moves to the other side of the inner case **110** is increased.

(36) In addition, as illustrated in FIGS. **4** to **7**, in the flow structure **10** of a companion animal dust collector according to the embodiment of the present invention, the main body part **100** further includes a moving guide part **160**, a streamlined protrusion **170**, a low pressure part **180**, and an air rotating unit **190**.

(37) Referring to FIGS. **4** and **6**, the plurality of moving guide parts **160** are partition walls that are arranged on at least one of the front and rear sides of the outside of the inner case **110** to move air introduced from the suction grill unit **300** to the other side of the outer case **120**.

(38) That is, when some of the air introduced into the suction grill unit **300** moves to the space part **130** and the remaining air flows in between the inner case **110** and the outer case **120**, the moving guide part **160** serves to partition and guide the air to move to the other side of the inner case **110**.

(39) For example, when there is no configuration of the moving guide part **160**, when air flows in between the inner case **110** and the outer case **120**, the air is mixed between the inner case **110** and the outer case **120** by the pushing force of the air introduced from the suction grill unit **300**, thereby preventing the air from moving in one direction.

(40) Therefore, it is preferable to form the moving guide part **160** to smoothly move the flow of air in one direction.

(41) Referring to FIG. **7**, the streamlined protrusion **170** is formed as a protrusion that lowers the pressure of air passing through the moving guide part **160** by forming a streamlined protrusion between each moving guide part **160**.

(42) That is, after the air moving to the outer surface of the inner case **110** along the moving guide part **160** is collected in the streamlined protrusion **170** to lower the pressure, by increasing the pressure of the part passing through the streamlined protrusion **170**, the movement speed is further increased due to the difference in air pressure.

(43) As a result, when air is introduced into the moving guide part **160**, next air replaces separate power to move the air.

(44) Referring to FIGS. **4** and **8**, the low pressure part **180** is a space that forms a lower air pressure on the other side of the outer case **120** due to the low-pressure air discharged from the air moving unit **140** and the air moving through the moving guide part **160**.

(45) The low pressure part **180** increases the volume of air to move a large amount of air to the discharge grill unit **420** formed on the cover part **400**, thereby inducing the air to a long distance from the main body part **100**.

(46) Referring to FIGS. **5** and **6**, the air rotating unit **190** serves to radially arrange the curved partition walls **191** around the suction fan unit **200** to form a discharge hole **192**, and rotate the air introduced from the space part **130**.

(47) In the curved partition wall **191**, curved plates are arranged radially at a center of a circle to rotate air in one direction inside an inlet **193** including an upper flange and a lower flange extending from a rim of a motor accommodating part **210** forming the suction fan unit **200**.

(48) In this case, the lower flange is formed to communicate with a communication hole **323** formed in an Air moving part **320**.

(49) Therefore, air flows into the lower flange through the communication hole **323** and rotates along the curved partition wall **191**.

(50) The discharge hole **192** discharges air moving through the curved partition wall **191** to the

outside and moves the air to the air moving unit **140** formed on the other side of the suction fan unit **200**.

(51) In addition, the discharge hole **192** maintains the rotational force of air by the air introduced into the inlet **193** and maintains the flow of air moving to the air moving unit **140**.

(52) As illustrated in FIGS. **3** and **4**, in the flow structure **10** of a companion animal dust collector according to the embodiment of the present invention, the suction fan unit **200** includes the motor fan formed inside the inner case **110**, and serves to introduce ambient air into the inner case **110**.

(53) To this end, the suction fan unit **200** further includes a motor accommodating part **210**, a motor fan shaft **220**, and a heat discharge pipe **230**.

(54) The motor accommodating part **210** is formed by accommodating an electric motor in a center of a partition plate that is disposed inside the inner case **110** and partitions one side and the other side.

(55) In addition, the motor accommodating part **210** allows a board P having an electronic circuit to be seated and coupled to operate a lighting unit **400** and an electric motor to be described later.

(56) The motor fan shaft **220** rotates by an electric motor and combines rotary blades at one end. Here, the rotary blade has a general shape and is omitted from the drawing in order to clearly identify the coupling relationship of the configuration of the present invention.

(57) The heat discharge pipe **230** is a pipe that extends from the motor accommodating part **210** to the other side of the inner case **110** and discharges heat generated by the operation of the electric motor to the outside.

(58) In particular, the heat discharge pipe **230** may further increase the movement speed of the air introduced into one side of the inner case **110** due to a temperature difference from the air introduced into the space part **130**.

(59) As illustrated in FIGS. **3** and **4**, in the flow structure **10** of a companion animal dust collector according to the embodiment of the present invention, the suction grill unit **300** is formed as a suction grill **310** coupled to one side of the outer case **120** and sucking in external air by the operation of the suction fan unit **200**.

(60) The suction grill **310** is formed as a frame having one side convex, and the convex one side forms an inclined surface to form a grill-shaped hole through which air is introduced into the one surface and the inclined surface, respectively.

(61) This suction grill **310** further includes a guide part **311** and an inflow hole **312**.

(62) The guide part **311** forms a protrusion on the inclined surface forming the suction grill **310** to guide external air to be collected in the center of one side of the outer case **120**.

(63) The inflow hole **312** is formed as a plurality of through holes on both sides of the suction grill **310** to allow the air collected in the suction grill **310** to inflow and move more air to the space part **130**.

(64) In addition, as illustrated in FIGS. **4** and **5**, the suction grill unit **300** further includes the Air moving part **320** and a dust collecting filter unit **330**.

(65) The Air moving part **320** is formed of a case-shaped body **321** with one side open to accommodate the suction grill **310**, and a plurality of wall protrusions **322** are formed on at least one of the outer surfaces of the body **321**.

(66) The wall protrusion **322** prevents air from being dispersed when some of the air introduced into the suction grill **310** is discharged and moves to the outside of the body **321**, and moves the air in one direction.

(67) Due to this, air is partitioned by the wall protrusion **322** and flows in between the inner case **110** and the outer case **120**.

(68) In this case, the air moving along the wall protrusion **322** is mixed with the air discharged through the above-described air discharge hole **143** and moves to the other side of the inner case **110**.

(69) Referring to FIGS. **4** and **5**, the dust collecting filter unit **330** is a filter that is disposed

between the suction grill **310** and the Air moving part **320** to collect the hair of the companion animal introduced into the suction grill **310** when the companion animal is located on one side of the inner case **110**.

(70) For example, when the companion animal is located on one side of the main body part **100** and combed, the hair of the companion animal may scatter.

(71) In this case, when the air and the hair of the companion animal scattered in the air flow into the suction grill **310** by the operation of the suction fan unit **200**, the dust collecting filter unit **330** collects the hair of the companion animal and allows the air to pass through.

(72) The dust collecting filter unit **330** is formed of a frame having one side coupled to the suction grill **310** and the other side converging to the center toward the Air moving part **320**, and at least one frame is formed inside the frame to form a through hole therein. A mesh net is attached to the frame.

(73) Meanwhile, as illustrated in FIGS. **1** and **4**, the flow structure **10** of a companion animal dust collector according to the embodiment of the present invention may include a cover part **400** and a lighting unit **500**.

(74) The cover part **400** is provided with a cover body **410** opening and closing the other side of the main body part **100** and at least one discharge grill unit **420** on both sides of one surface of the cover body **410**, respectively.

(75) The discharge grill unit **420** serves to discharge the air collected by the low pressure part **180** to the outside to dry the hair of the companion animal located on the other side of the main body part **100** or guide purified air to every corner of a house.

(76) Referring to FIGS. **4** and **5**, the lighting unit **500** may dispose an infrared lamp **520**, which is accommodated in the other side of the main body part **100** and emits light, in an accommodating part **510**.

(77) The accommodating part **510** may form a space extending inwardly of the inner case **110** at the center of the cover body **410** and operate by connecting the infrared lamp **520** to the substrate P.

(78) In addition, the lighting unit **500** may transmit light emitted from the infrared lamp **520** to the outside by forming a transmission unit **430** that is detachable to open and close the center of the cover body **410**.

(79) As a result, the effect of preventing skin diseases, arthritis, and otitis media of companion animals may be expected.

(80) As described above, in the detailed description of the present invention, the preferred embodiments of the present invention have been described, but this exemplarily describes the best embodiment of the present invention and does not limit the present invention. In addition, those skilled in the art to which the present invention pertains may make various modifications and imitations within the scope of the technical spirit of the present invention.

(81) Therefore, the scope of the present invention is not limited to the above-described embodiments, but may be implemented in various forms of embodiments within the scope of the appended claims. All ranges that can be modified without departing from the gist of the present invention claimed in the claims by those skilled in the art to which the invention pertains are considered to be within the scope of the claims of the present invention.

DESCRIPTION OF REFERENCE SIGNS

(82) **10**: Flow structure of a companion animal dust collector **100**: Main body part **110**: Inner case **120**: Outer case **130**: Space part **140**: Air moving unit **141**: First air moving unit **142**: Second air moving unit **143**: Air discharge hole **150**: Cyclone unit **160**: Moving guide part **170**: Streamlined protrusion **180**: Low pressure part **190**: Air rotating unit **191**: Curved partition wall **192**: Discharge hole **193**: Inlet **200**: Suction fan unit **210**: Motor accommodating part **220**: Motor fan shaft **300**: Suction grill unit **310**: Suction grill **311**: Guide part **312**: Inflow hole **320**: Air moving part **321**: Body **322**: Wall protrusion **323**: Communicating hole **330**: Dust collecting filter unit **400**: Cover

part **410**: Cover body **420**: Discharge grill unit **500**: Lighting unit **510**: Accommodating part **520**: Infrared lamp **530**: Transmission unit

Claims

1. A flow structure of a companion animal dust collector, comprising: a main body part that includes an inner case through which air or hair of a companion animal is introduced and an outer case surrounding front and rear surfaces of the inner case and discharging air moving through the inner case to the outside; a suction fan unit that has a motor fan inside the inner case; and a suction grill unit that includes a suction grill coupled to one side of the outer case and sucking in external air by the operation of the suction fan unit, wherein the main body part further includes: a space part that collects air introduced into the suction grill unit to one side of the suction fan unit; and an air moving unit that includes first air moving units communicating with the space part and extending facing each other around the other side of the suction fan unit and a second air moving unit communicating with the space part on at least one side of the first air moving unit and extending to the other side of the suction fan unit, and wherein the main body part further includes an air rotating unit which radially arranges curved partition walls around the suction fan unit to form discharge holes and rotates the air introduced from the space part.
 2. The flow structure of a companion animal dust collector of claim 1, wherein the air moving unit further includes a cyclone unit for rotating the moving air by forming a spiral protrusion on an inside of the second air moving unit.
 3. The flow structure of a companion animal dust collector of claim 1, wherein the air moving unit lowers a pressure of air discharged to the other side by forming a small area from one side toward the other side.
 4. The flow structure of a companion animal dust collector of claim 1, wherein the main body part further includes a plurality of moving guide parts that are arranged on at least one of the front and rear sides of the outside of the inner case to move the air introduced from the suction grill unit to the other side of the outer case.
 5. The low structure of a companion animal dust collector of claim 4, wherein the main body part forms streamlined protrusions between the moving guide parts, respectively, to lower the pressure of air passing through the moving guide part.
 6. The flow structure of a companion animal dust collector of claim 4, wherein the main body part further includes a low pressure part that forms a lower air pressure on the other side of the outer case due to low pressure air discharged from the air moving unit and the air moving through the moving guide part.
 7. The flow structure of a companion animal dust collector of claim 1, wherein the suction grill unit further includes an air moving part that moves air to at least one surface of the front and rear surfaces of the inner case by forming a body having a communication hole accommodated in the space part and communicating with the suction fan unit and forming a plurality of wall protrusions arranged on a bent surface of the body.
 8. The flow structure of a companion animal dust collector of claim 7, wherein the suction grill unit further includes a dust collecting filter unit that is disposed between the suction grill and the air moving part to collect the hairs of the companion animal flowing into the suction grill when the companion animal is located on one side of the inner case.
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