PATENT PENDING

SINKGUARD

Odour trap with integrated preventive grease & oil separation (DN40/DN50) for household and building drainage systems

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1. Title of the Invention

Kitchen odour trap/trap seal with integrated, serviceable grease and oil separation while maintaining standard-compliant main flow.

2. Technical Field

The invention relates to sanitary drainage technology, in particular to kitchen sink odour traps/trap seals for household and multi-unit building applications. The invention further relates to traps with standard connections and nominal sizes DN40 and/or DN50 providing preventive separation of grease and oil components from wastewater without requiring external add-on devices or additional installation space.

3. Background Art

Conventional kitchen traps are designed primarily as odour seals (water seals). Such traps (tube traps and bottle traps) are not designed to selectively retain grease and oils. In practice, grease and oil enter the drain when rinsing pans, pots, sauces and frying residues, deposit in the trap and downstream pipes, solidify and cause reduced cross-sections, odours and blockages.

Commercial grease separators (e.g., EN 1825) are known, primarily for professional kitchens, but are bulky, costly and unsuitable for typical under-sink household installations. Household solutions such as strainers or access fittings may retain solids or support cleaning after a blockage occurs, but do not provide an integrated preventive grease/oil separation directly at the trap.

4. Problem to be Solved

It is an object of the invention to provide a kitchen trap/odour seal that (i) functions as a full odour trap with sufficient water seal, (ii) maintains standard-compliant main flow performance, (iii) provides preventive separation and collection of grease and oil components, (iv) requires no external add-on devices and no additional installation space, (v) enables easy servicing without disassembling pipe connections, and (vi) reduces blockages and recurring service costs in household and building applications.

5. Summary of the Invention

The object is achieved by an odour trap in which the main wastewater flow is discharged in a central flow core pipe while grease and oil components are guided via a hydraulically decoupled secondary flow path into a separate grease/oil separation zone.

The grease/oil separation zone is preferably implemented as a removable cartridge having a calm collection zone. Coupling between main flow and secondary flow is arranged above the operating water level, so that the odour seal function is not reduced. Servicing is performed by removing the cartridge while the flow core remains installed and the water seal is maintained.

6. Detailed Description (SINKGUARD 2.0 PRO – DN40/DN50)

The following describes a preferred embodiment. Deviations (e.g., other housing geometries, cartridge forms and connection variants) are covered by the claims.

6.1 Assembly Groups (exploded logic)

A) Connector head: standard sink connection (e.g., G 1½"), optionally with appliance connection (e.g., dishwasher).

B) Flow core: fixed core pipe (DN40 or DN50) guiding the main flow path.

C) Outer shell: housing with wall outlet (DN40/DN50) forming the water seal.

D) Grease cartridge: removable insert forming a ring gap and a calm collection zone; optionally with a window for fill-level indication.

E) Closure/seal: releasable connection (e.g., bayonet) with an elastic seal (e.g., EPDM lip seal) for leak-tight servicing.

6.2 Hydraulic operation (step-by-step)

(1) Inlet / main flow: wastewater enters through the connector head into the flow core. The flow core is designed without constrictions to allow solids to pass.

(2) Odour seal / water seal: the housing forms a standing water column (water seal). The seal height is defined by the wall outlet position and the lower edge of the flow core.

(3) Flow guidance: after descending in the core, the flow is redirected in the lower housing region and discharged to the wall outlet (bottle trap principle or functionally equivalent).

(4) Grease separation as secondary flow (“skimming”): openings/slots in the upper portion of the flow core allow preferential transfer of grease/oil-laden phase into the secondary path (ring gap/cartridge). The openings are arranged above the operating water level so the odour seal is not impaired.

(5) Calm zone / coalescence: in the ring gap between flow core and cartridge wall the flow is calmer; grease droplets coalesce and rise due to lower density. A calm collection zone is provided that is largely hydraulically decoupled so grease can accumulate.

(6) Indication (optional): a window may be arranged in the collection zone to allow visual inspection.

(7) Service: release the closure, remove cartridge, dispose grease, clean cartridge, reinsert—no pipe disassembly required.

(8) Odour security during service: the flow core remains installed; the water seal remains present. Additional labyrinth/skirt geometries may prevent direct air passage to the sewer during service.

6.3 Materials and sealing (preferred)

For series production, thermoplastics, in particular polypropylene (PP), are preferred. Seals are preferably elastic lip seals (e.g., EPDM) to provide robust, long-term leak tightness.

7. Embodiments and variants

The invention includes DN40 and DN50 variants and household/building applications. The separation zone may be realized as a removable cartridge, reservoir or housing chamber. The coupling openings/slots may vary in number and shape provided the main flow remains standard-compliant and the grease/oil separation is implemented as a hydraulically decoupled secondary flow.

8. Claims (extended)

1. An odour trap for sanitary drainage systems, in particular for kitchen sinks in household and building applications, comprising a housing with a wall outlet, a flow core pipe arranged within the housing for guiding a main wastewater flow, a water seal formed by a standing water column, and at least one grease and oil separation zone hydraulically decoupled from the main wastewater flow, wherein the grease and oil separation zone is configured as a secondary flow path communicating with the main wastewater flow above an operating water level of the water seal so that grease and oil components are separated while the main wastewater flow is discharged substantially unaffected through the flow core pipe.

2. The odour trap according to claim 1, wherein the flow core pipe is configured as DN40 and/or DN50.

3. The odour trap according to any of the preceding claims, wherein the housing is configured as a bottle trap or a functionally equivalent odour trap design.

4. The odour trap according to any of the preceding claims, wherein the secondary flow path is connected to the main wastewater flow via at least one opening or slot, or a plurality of openings or slots, in the flow core pipe.

5. The odour trap according to claim 4, wherein the opening(s) or slot(s) are arranged above the operating water level of the water seal.

6. The odour trap according to any of the preceding claims, wherein the opening(s) are configured as vertically oriented elongated holes (slots).

7. The odour trap according to any of the preceding claims, wherein the grease and oil separation zone comprises a hydraulically calmed collection region in which grease and oil accumulate due to lower density than water.

8. The odour trap according to any of the preceding claims, wherein the grease and oil separation zone is configured as a removable cartridge.

9. The odour trap according to claim 8, wherein the cartridge is removable without interrupting the water seal.

10. The odour trap according to any of the preceding claims, wherein the flow core pipe is fixed within the housing and remains installed during service or cartridge removal.

11. The odour trap according to any of the preceding claims, comprising structural means configured to prevent a direct air passage to the sewer during cartridge removal.

12. The odour trap according to any of the preceding claims, wherein the grease and oil separation zone comprises a transparent or translucent portion for visual inspection of accumulated grease and oil.

13. The odour trap according to any of the preceding claims, wherein the housing and/or cartridge is made of a thermoplastic material, in particular polypropylene.

14. The odour trap according to any of the preceding claims, comprising at least one elastic seal between the cartridge and the housing, in particular a lip seal.

15. The odour trap according to any of the preceding claims, wherein the cartridge is releasably connected to the housing by a bayonet, latch or quick-release connection.

16. The odour trap according to any of the preceding claims, configured for use in private households, commercial kitchens or multi-unit residential buildings.

17. The odour trap according to any of the preceding claims, wherein the grease and oil separation zone is configured for preventive reduction of grease deposits in downstream pipework.