CLAIMS:

1. A multi-flap hinge system for use with a door assembly or a window assembly, said system comprising:

a first flap designed for attachment to a door or window frame;

a second flap designed for attachment to a door or window structure;

a third flap comprising a modular interface configured for reversible attachment of one or more elements selected from a wire mesh, laminated glass panel, or roller blind;

a fourth flap designed for attachment to a gate or grill structure;

wherein said first, second, third, and fourth flaps are of identical thickness and aligned together in a compact configuration; and, wherein each of the flaps is integrated as a single unit and capable of independent rotation around a common central stem.

2. The multi-flap hinge system as claimed in claim 1, wherein the third flap includes a secure coupling interface to enable interchangeable fitting of a wire mesh, a laminated glass panel, or a roller blind.

3. The multi-flap hinge system as claimed in claim 2, wherein said securely coupled wire mesh option provides ventilation and protection against insects when said door or said window is open.

4. The multi-flap hinge system as claimed in claim 2, wherein the securely coupled laminated glass panel acts as a barrier, preventing a leakage of air-conditioned or heated air while maintaining visibility.

5. The multi-flap hinge system as claimed in claim 2, wherein the securely coupled roller blind, when rolled up, allows for better ventilation by enabling air to pass through and, when rolled down, acts as a barrier, preventing insects and mosquitoes from entering the space.

6. The multi-flap hinge system as claimed in claim 1, wherein said flap alignment is configured to maintain mechanical symmetry for rotational stability, enabling compact hinge performance and minimal protrusion from the mounted surface.

7. The multi-flap hinge system as claimed in claim 1, wherein said door or window assembly, along with any accompanying grill structures, is configured to move together in an angular path when secured, such that each attached element retains its individual swing axis while constrained by the central stem of the hinge system.

8. A method of installation of a door or window assembly utilizing said multi-flap hinge system of claim 1, said method comprising the steps of:

fitting said door or said window frame;

attaching at least one multi-flap hinge to said door or said window frame, a door or a window structure, a mesh structure or a laminated glass panel or a roller blind, or a gate or a grill structure; and

securing said door or said window structure to said gate or said grill structure;

wherein each element is pre-aligned for simultaneous angular motion about a central axis defined by the hinge;

wherein the method of installation provides a lockable entry mechanism to retract said deadbolt, digital lock, half deadbolt lock, or mortise lock case with lever handle including operation through a keyhole and/or a smart system such as a digital card reader, pin code, thumb print, voice or facial recognition.

9. The method of installation as claimed in claim 8, wherein said door or said window structure is releasably secured to said gate or said grill structure using a deadbolt lock, a digital lock, a half deadbolt lock, or a mortise lock case with lever handle, integrated within the hinge structure or flap housing.