segment (102A) and a smaller diameter segment (102B), and is configured to engage a first pipette tip (130) sized to fit over the larger diameter segment (102A), and wherein the barrel (102) is further configured to engage a second pipette tip (132) sized to fit over the smaller diameter segment (102B) of the barrel (102) wherein the piston includes a stepped profile, a drive rod portion and a free end portion extending from the drive rod portion, the free end portion having a different diameter than the drive rod portion, wherein the barrel includes a stepped bore defined by the barrel body, the stepped bore having an axial hole and a coaxial counterbore, the axial hole passing through the tip, and wherein the device further comprises: a first seal element between and engaging the barrel and the free end portion; and a second seal element between and engaging the barrel and the drive rod portion; and wherein the piston is disposed within the barrel such that at most one of the first seal element and the second seal element engages between the barrel and the piston. In some embodiments, the piston (104) may include a stepped profile, a drive rod portion (104B) and a free end portion (104C) extending from the drive rod portion (104B), the free end portion (104C) having a different diameter than the drive rod portion (104B), wherein the barrel (102) includes a stepped bore (108) defined by the barrel body (102A), the stepped bore (108) having an axial hole (108A) and a coaxial counterbore (108B), the axial hole (108A) passing through the tip (122), and wherein the device may further include a first seal element (112) between and engaging the barrel (102) and the free end portion (104C); and wherein the device may further include a second seal element (114) between and engaging the barrel (102) and the drive rod portion (104B). In some embodiments, a length of the free end portion may be greater than a length of the axial hole (108A). In some embodiments, the stepped bore (108) may further include a bore portion (108C), wherein a diameter of the bore portion (108C) is smaller than a diameter of the counterbore (108B) and is larger than a diameter of the axial hole (108A), and wherein the first seal element (112) is fixed within the bore portion (108C). In some embodiments, the smaller diameter segment (102B) may coincide with the tip (122), and the larger diameter segment (102A) may extend from the smaller diameter segment (102B), and the counterbore (108B) may be disposed within the larger diameter segment (102A). In some embodiments, the device may further include a

shuck plate (142) disposed about the barrel (102) and configured to move axially with respect to the barrel (102). In some embodiments, the second pipette tip (132) may have a body (132A) forming a lumen (132B), and a barrier (140) spanning the lumen (132B), the second pipette tip (132) engaging the barrel (102), and wherein, when the second pipette tip (132) is engaged to the barrel (102), an end of the free end portion (104C) can contact the barrier (140). In some embodiments, the device may further include a shuck plate (142), wherein when the second pipette tip (132) is engaged to the barrel (102), the shuck plate (142) contacts

WHAT IS CLAIMED IS:

1. A device for transferring liquid comprising:

a piston; and

a barrel including a barrel body, and a tip formed in the barrel body, the barrel including a larger diameter segment and a smaller diameter segment, wherein the barrel is configured to engage a first pipette tip sized to fit over the larger diameter segment, and wherein the barrel is further configured to engage a second pipette tip sized to fit over the smaller diameter segment of the barrel;

wherein the piston includes a stepped profile, a drive rod portion and a free end portion extending from the drive rod portion, the free end portion having a different diameter than the drive rod portion,

wherein the barrel includes a stepped bore defined by the barrel body, the stepped bore having an axial hole and a coaxial counterbore, the axial hole passing through the tip, and wherein the device further comprises:

a first seal element between and engaging the barrel and the free end portion; and

a second seal element between and engaging the barrel and the drive rod portion; and

wherein the piston is disposed within the barrel such that at most one of the first seal element and the second seal element engages between the barrel and the piston.

~~2. The device of claim 1:~~

~~wherein the piston includes a stepped profile, a drive rod portion and a free end portion extending from the drive rod portion, the free end portion having a different diameter than the drive rod portion,~~

~~wherein the barrel includes a stepped bore defined by the barrel body, the stepped bore having an axial hole and a coaxial counterbore, the axial hole passing through the tip, and wherein the device further comprises:~~

~~a first seal element between and engaging the barrel and the free end portion; and~~

~~a second seal element between and engaging the barrel and the drive rod portion.~~

~~3~~2. The device of claim ~~2~~1, wherein a length of the free end portion is greater than a length of the axial hole.

~~4~~3. The device of any of claims ~~2~~ 1 or ~~3~~2, wherein the stepped bore further comprises a bore portion, wherein a diameter of the bore portion is smaller than a diameter of the counterbore and is larger than a diameter of the axial hole, and wherein the first seal element is fixed within the bore portion.

~~5~~4. The device of any of claims ~~2~~1-~~4~~3, wherein, the smaller diameter segment coincides with the tip, and the larger diameter segment extends from the smaller diameter segment, and the counterbore disposed within the larger diameter segment.

~~6~~5. The device of any of claims ~~2~~1-~~5~~4, further comprising:

a shuck plate disposed about the barrel and configured to move axially with respect to the barrel.

~~7. The device of any of claims 2-5, wherein the second pipette tip has a body forming a lumen, and a barrier spanning the lumen, the second pipette tip engaging the barrel, and wherein, when the second pipette tip is engaged to the barrel, an end of the free end portion can contact the barrier.~~

~~8. The device of claim 7, further comprising a shuck plate, wherein when the second pipette tip is engaged to the barrel, the shuck plate contacts the second pipette tip.~~

~~9~~6. The device of any of claims ~~2~~1-~~8~~5, wherein the piston further comprises an engagement portion extending from the drive rod portion.

~~10~~7. The device of any of the preceding claims, further comprising:

an actuator coupled to the piston for moving the piston up and down.

~~11~~8. The device of claim ~~10~~7, further comprising a gripper having at least two gripper fingers, wherein the actuator is further coupled to the gripper for moving the at least two gripper fingers.

~~12. The device of any of claims 2-11, wherein the piston is disposed within the barrel such that at most one of the first seal element and the second seal element engages between the barrel and the piston.~~

~~13. The device of any of the preceding claims, wherein the second pipette tip includes a filter barrier that can be pushed by the piston to separate the second pipette tip from the barrel.~~

9. A liquid transferring system, comprising:

the device of any one of claims ~~2~~1-8~~,~~;

a first pipette tip sized to fit over the larger diameter segment of the barrel; and

~~and~~ a second pipette tip sized to fit over the smaller diameter segment of the barrel;

wherein the second pipette tip has a body forming a lumen, and a barrier spanning the lumen, the second pipette tip engaging the barrel, and wherein, when the second pipette tip is engaged to the barrel, an end of the free end portion can contact the barrier.

10. The system of claim 9, further comprising a shuck plate, wherein when the second pipette tip is engaged to the barrel, the shuck plate contacts the second pipette tip.

11. The system of claims 9-10, wherein the second pipette tip includes a filter barrier that can be pushed by the piston to separate the second pipette tip from the barrel.

~~14~~12. A method of using ~~a~~ the device of claims 1-8 for transferring a liquid ~~comprising (a) a piston, and (b) a barrel including a barrel body, and a tip formed in the barrel body, the barrel including a larger diameter segment and a~~

~~smaller diameter segment, wherein the barrel is configured to engage a first pipette tip sized to fit over the larger diameter segment, and wherein the barrel is further configured to engage a second pipette tip sized to fit over the smaller diameter segment of the barrel~~, the method comprising:

in a first high volume pipetting mode, aspirating a first liquid by withdrawing the piston from the barrel, and dispensing the first liquid using the first pipette tip; and

in a second low volume pipetting mode, aspirating, a second liquid by withdrawing the piston from the barrel, and dispensing the second liquid using the second pipette tip.

~~15~~13. The method of claim ~~14~~12, ~~wherein the piston includes a stepped profile, a drive rod portion and a free end portion extending from the drive rod portion, the free end portion having a different diameter than the drive rod portion, the barrel including a stepped bore defined by the barrel body, the stepped bore having an axial hole and a coaxial counterbore, the axial hole passing through the tip, a first seal element between and engaging the barrel and the free end portion, and a second seal element between and engaging the barrel and the drive rod portion, and~~

wherein in the first high volume pipetting mode, the first liquid is aspirated by withdrawing the piston from the barrel such that the free end portion is above and moves away from the axial hole, and the first liquid is dispensed by dispensing the first liquid by inserting the piston onto the barrel such that the free end portion moves toward the axial hole; and

wherein in a second low volume pipetting mode, the second liquid aspirated by withdrawing the piston from the barrel such that the free end portion remains in the axial hole, and the second liquid is dispensed by inserting the piston into the barrel such that the free end portion remains in the axial hole.